Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

MEMORANDUM

TO: Water Resources Commission

FROM: Thomas M. Byler, Director

SUBJECT: Agenda Item E, June 24, 2020
Water Resources Commission Meeting

Request for Adoption of Rules Relating to Dam Safety - Oregon Administrative Rules Chapter 690, Division 20

I. Introduction

During this agenda item, staff will summarize the rulemaking process, public comments received, and ask the Commission to consider adoption of proposed amendments to Oregon Administrative Rules Chapter 690, Division 20.

II. Background

Passage of House Bill 2085 during the 2019 regular Legislative Assembly session modernized Oregon's dam safety authorities. The new statutes (ORS 540.443 to 540.991) become operative on July 1, 2020 and necessitate rulemaking. An overview of the changes to the Oregon Dam Safety Program, including a high-level overview of proposed rule changes, is contained in Attachment 1. The statutes and these proposed rules are based in part on the Model State Dam Safety Program established by the Association of State Dam Safety Officials and the Federal Emergency Management Agency.

III. Overview of Rules

This rulemaking proposes to amend 21 existing rules, adopt 14 new rules, and repeal eight rules in OAR Chapter 690, Division 20 ("Dam Safety"). A list of the affected rules, indicating amendment, adoption, or repeal, is contained in Attachment 2.

This proposed rulemaking updates the existing rules and adopts new rules to implement the new statutes. These changes:

- Update existing rules related to engineering requirements for designs and submittals of documents for new dams and modifications to dams, as well as increasing dam height and update the approval process
- Specify the Department's role on federal dams;
- Clarify processes for determinations of dam hazard rating;
- Implement assessment and collection of fees for review and approval of certain dam designs;
- Outline parameters of communication with dam owners following a dam inspection;

- Clarify authorities and rights related to emergency actions at dams;
- Outline requirements and procedures for removal plans when a dam is to be removed;
- Identify the schedule for application of civil penalties;
- Specify procedures for inspecting dams and addressing maintenance issues, unsafe conditions, and potentially unsafe conditions, including procedures for communicating and cooperatively addressing issues with dam owners.

IV. Rulemaking Process

The Department convened a Rule Advisory Committee (RAC) to review and provide feedback on modifications to existing rules, proposed new rules, and rules to be repealed, as well as to provide input on the fiscal impact of the proposed rules. A list of RAC members is contained in Attachment 3. The RAC met four times between October 2019 and January 2020.

The first Notice of Proposed Rulemaking was filed with the Secretary of State on February 27, 2020, and three public hearings were planned for March. The first public comment period ended on April 6; however, the scheduled public hearings were cancelled due to COVID-19. A revised and corrected Notice of Proposed Rulemaking was filed with the Secretary of State on April 29, with the public comment period ending on May 29 and a public hearing conducted via toll-free conference call on May 28. The second Notice of Proposed Rulemaking is contained in Attachment 4, which includes a marked-up copy of the existing rules with the proposed changes for public comment. The Department received eight written public comments and no oral public comments.

V. Summary of Public Comments Received and Changes to Proposed Rules as a Result of Public Comments

A complete copy of each public comment received is contained in Attachment 5. High-level summaries of public comments received and the Department's responses are contained in Attachment 6.

The Department put significant effort into considering public comments and modifying the proposed rules. In addition, in response to one commenter's concerns that some of the rules were beyond the scope of the statute, Department staff conducted a close comparison of the related statutory provisions and the proposed rules. It is important to note the Department and Commission are required to implement and interpret the statutes, within the scope of authority provided in the statutes; however, the Commission and Department are not required to copy statutory language verbatim. The Department did find some areas of the rules that required modification to conform to statutory authority and appreciates the commenter's close review of the rules.

After careful consideration of public comments received and a final review by Department staff, the Department made minor grammatical, punctuation, capitalization, and citation changes, as well as more substantive edits.

Attachment 7 contains a markup of the existing rules, showing changes as proposed in the public comment draft of the rules (same as included in Attachment 4 but easier to read). Attachment 8 reflects the final proposed amended rules with the markup showing only those changes made as a result of public comments received and a final review by Department staff. Attachment 9 contains an unmarked version of the final proposed amended rules.

VI. Conclusion

Department staff have worked to modernize the dam safety program over the past several years. Adoption of the proposed rules will help the Department, owners of dams, and potential owners of dams to ensure the safe construction, maintenance, repair, and removal of these structures that are important supplies of water for Oregonians. The final proposed amended rules for consideration by the Commission are contained in Attachment 9.

VII. Alternatives

1. Adopt the final proposed amended rules OAR Chapter 690, Division 20 as contained in Attachment 9.
2. Modify and adopt the proposed amended rules in Attachment 9 for OAR Chapter 690, Division 20.
3. Direct Department staff to do further work on the rules and return to a future Commission meeting.

VIII. Recommendation

The Director recommends Alternative 1, to adopt the final proposed amended rules OAR Chapter 690, Division 20 as contained in Attachment 9.

Attachments:

1. Overview of Changes to Oregon's Dam Safety Program
2. List of Rules Amended, Adopted, and Repealed
3. RAC Members
4. Notice of Rulemaking and Public Comment Draft of Proposed Rules
5. Public Comments
6. Department Response to Public Comments
7. Public Comment Draft of the Rules - Markup showing changes to existing rules
8. Final Proposed Amended Rules - OAR Chapter 690, Division 20 including only markup following the public comment period
9. Final Proposed Amended Rules - OAR Chapter 690, Division 20 (no markup)

Keith Mills
(503) 986-0840

Tony Janicek
(503) 986-0839

Racquel Rancier
(503) 302-9235

Breeze Potter
(503) 986-0874

Overview of Changes to Oregon's Dam Safety Program

Dam Safety Program Elements after HB 2085 Rulemaking:

The original focus of Oregon's Dam Safety Program was the review and approval of designs for new dams. A majority of Oregon's dams were constructed decades ago, with some more than 100 years old, shifting the Department's focus to existing dams. As discussed in Oregon's 2017 Integrated Water Resources Strategy, in recent years, we have learned more about risks to dams posed by earthquakes, extreme floods, and internal erosion – risks not understood when most dams were constructed. The dam safety emphasis is now the safety of existing dams. "Hazard" refers to the consequences of dam failure, and not the condition of the dam. The Dam Safety Program oversees around 950 dams, including 76 dams rated High Hazard and 151 dams rated Significant Hazard.

House Bill 2085 (2019) was passed during the 2019 Legislative Session and is codified in Oregon Revised Statutes 540.443–540.991, which become operative on July 1, 2020. Below is a summary of the key components of the program, and how new statutes and proposed rules modify program components.

Jurisdiction: Consistent with the Department's past application of the law, and clarifications provided by the new statutes, Oregon's dam safety laws apply to: (1) dams that are at least ten-feet high and store three million gallons (9.2 acre feet) of water or wastewater. With the exception of roles in emergencies, the laws do not apply to dams owned by or regulated under a federal dam safety program.

Hazard Rating: Existing rules that describe how the hazard rating is determined have been clarified to better reflect current technical practice.

Designs for New Dams: Rules for most aspects of new dam construction were adopted in 2015. These existing rules were reviewed and updated during this rulemaking. Pursuant to the new statutes, the rules outline the process for assessment and collection of a new fee for reviewing plans for new construction, based on actual time spent on the review and with a cap to provide certainty on the maximum that may be charged. The fee only applies to new construction and raising the height of the dam, not other modifications. The proposed rules also require Department review and acceptance of final engineering documentation that the dam was built as specified before water or wastewater can be impounded.

Modification of Dams: The old statutes lacked clarity on modifications and approval prior to impoundment. The proposed rules require plans and specifications for modifications of dams to be approved by the Department and provide further guidance on repairs that are considered to be modifications.

Inspecting Dams: The specified inspection frequency has not changed. High Hazard dams are scheduled for annual inspections, Significant Hazard dams are scheduled for inspections every three years, and Low Hazard dams are scheduled for inspection every six years. Consistent with the new statutes, the proposed rules include provisions for the Department to provide an inspection summary identifying needed maintenance actions.

Maintenance Actions: The new statutes allow the Department to require an owner to take action on maintenance issues. The proposed rules identify maintenance actions and provide a process for addressing maintenance actions if left unaddressed.

Incident Response: The statutes and proposed rules outline actions to take in the event of a dam emergency.

Removal of Dams: The previous statutes did not authorize any formal actions related to dam removal. The new law requires submittal of a removal plan for high and significant hazard dams, and if necessary hiring of an engineer, to ensure they are removed in a manner that protects people, property, and public infrastructure. The proposed rules provide additional guidance on the Department's review of plans for removal of dams.

Addressing Safety Deficiencies of Dams: The process under the previous statutes was antiquated and inconsistent with the Administrative Procedures Act (APA). Previously, a hearing was required when a dam was determined to be unsafe, whether or not the dam owner requested a hearing (and prior to any safety action). The new laws and proposed rules allow the Department to work with the dam owner to develop a plan and timeframe for repair, instead of going directly to enforcement. The proposed rules clarify the process for how a dam is determined "unsafe" or "potentially unsafe" and the dam owner is notified of the determination. For dams that are unsafe, the process allows the Department to work with the dam owner on a plan and timeframe for repair, but also provides the option of issuing a proposed final order and holding a hearing, if one is requested by the dam owner. The proposed rules describe this process in detail, consistent with the new dam safety statutes and the APA.

Civil Penalties: The prior law did not authorize civil penalties for dam safety violations. The new statutes authorize civil penalties. The proposed rules allow civil penalties in five situations: (1) Modifying dam height or building a new dam without prior written Department approval of design documents; (2) Impoundment of water before as-built documentation has been submitted and accepted; (3) Conducting construction work to remove a high or significant hazard rated dam without submitting a dam removal plan; (4) Failure to submit an Emergency Action Plan for a high hazard rated dam; and (5) Failure to complete needed dam maintenance actions on a high or significant hazard dam.

Division 20 Dam Safety Rulemaking (2019-2020)

Rules Advisory Committee Membership

No.	*Name*	*Representing*
1	Chris Bahner	WEST Consulting Engineers
2	Corbey Boatwright	Boatwright Engineering
3	Mary Ann Cooper	Oregon Farm Bureau
4	Tim Gross	City of Newport, Public Works Director
5	Gerry Hesiln	Cornforth Consulting Engineers
6	Robert Klein	McMinnville Water and Light
7	Peggy Lynch	League of Women Voters
8	Kimberley Priestley	WaterWatch of Oregon
9	Genice Rabe	Private Dam Owner
10	Tracy Rutten	League of Oregon Cities
11	April Snell	Oregon Water Resources Congress
12	Wayne Stinson	Douglas County Emergency Management

Complete List of Rules Proposed to be Amended, Adopted, and Repealed

Chapter 690, Division 20 "Dam Safety"

RULES TO AMEND

690-020-0000 Purpose and Applicability
690-020-0022 Definitions
690-020-0035 Engineering Design Reqts
690-020-0036 Site/Geotechnical
690-020-0037 Hydrology and Flood
690-020-0038 Embankment Dams
690-020-0041 Concrete Dams
690-020-0042 Spillways
690-020-0043 Conduits and Control
690-020-0044 Instrumentation
690-020-0047 Geosynthetics
690-020-0048 Modification of Reqts
690-020-0055 Design Drawings
690-020-0060 Construction Specs.
690-020-0065 Construction Admin
690-020-0070 Engineer Submittals
690-020-0080 Approvals
690-020-0100 Hazard Rating
690-020-0120 Inundation Analysis
690-020-0250 Maintenance
690-020-0400 Emergency Action Plan

RULES TO ADOPT

690-020-0024 Authorities and Coordination
690-020-0026 Fees
690-020-0028 Preliminary Plans/Specs
690-020-0068 Operation/Maint Plan
690-020-0140 Dam Modifications
690-020-0160 Removal
690-020-0180 Contact and title transfer
690-020-0260 Inspection of Dams
690-020-0310 Maintenance Actions
690-020-0340 Potentially Unsafe, Unsafe
690-020-0420 Immediate Actions
690-020-0460 Orders and Hearings
690-020-0600 Civil Penalties

RULES TO REPEAL

690-020-0023 Review Process
690-020-0025 General Reqts
690-020-0029 Non stat. dams
690-020-0150 Inspection
690-020-0200 Annual Program Fee
690-020-0300 Approval-modification
690-020-0350 Operation/Maint Plan
690-020-0500 Enforcement

OFFICE OF THE SECRETARY OF STATE
BEV CLARNO
SECRETARY OF STATE

JEFF MORGAN
INTERIM DEPUTY SECRETARY OF STATE

ARCHIVES DIVISION
STEPHANIE CLARK
DIRECTOR

800 SUMMER STREET NE
SALEM, OR 97310
503-373-0701

NOTICE OF PROPOSED RULEMAKING

INCLUDING STATEMENT OF NEED & FISCAL IMPACT

CHAPTER 690
WATER RESOURCES DEPARTMENT

FILED
04/29/2020 11:44 AM
ARCHIVES DIVISION
SECRETARY OF STATE

FILING CAPTION: Safety of Dams including Design, Construction, Maintenance, Corrective Action, Removal, and Emergencies

LAST DAY AND TIME TO OFFER COMMENT TO AGENCY: 05/29/2020 5:00 PM

The Agency requests public comment on whether other options should be considered for achieving the rule's substantive goals while reducing negative economic impact of the rule on business.

CONTACT: Racquel Rancier
503-986-0828
racquel.r.rancier@oregon.gov

725 Summer Street NE, Suite A
Salem,OR 97301

Filed By:
Racquel Rancier
Rules Coordinator

HEARING(S)

Auxilary aids for persons with disabilities are available upon advance request. Notify the contact listed above.

DATE: 05/28/2020
TIME: 9:00 AM
OFFICER: Keith Mills
ADDRESS: Toll-Free Conference Call
Call-In Number: 1-800-719-8139
Conference Call Code: 177486
Salem, OR 97301
SPECIAL INSTRUCTIONS:
Due to COVID-19, the public hearing will held by conference call. To join the hearing, dial 1-800-719-8139. When prompted, dial conference code 177486 on your telephone keypad. Upon joining the conference call, you will be asked to announce your name. To prevent background noise, attendees may be muted. Individuals wanting to submit oral testimony, must call in and indicate an interest in testifying by pressing 5* on your telephone keypad, no later than 9:15 am. The hearing will close no later than 10:30 am, but may close as early as 9:20 am if all individuals that have

signed up to testify have had the
opportunity to enter their comments
into the record.

NEED FOR THE RULE(S):

Dams provide a number of benefits such as controlling floods, and capturing water for irrigation, municipal, recreation, fisheries, and other purposes. While dams provide a variety of benefits, failure of a dam can result in loss of life and damage to property and infrastructure. Oregon has adopted a dam safety program to ensure dams are designed and maintained to reduce the risk of failure. The Oregon Water Resources Department is the state agency charged with overseeing the safety of dams across the state that are not regulated by a federal dam safety program.

Until recently, Oregon's dam safety statutes had remained relatively unchanged since 1929. In 2017, the Oregon Legislature passed House Bill 3427, regarding Emergency Action Plans for high-hazard dams. In 2019, the Oregon Legislature passed House Bill 2085 (Chapter 390, Oregon Laws 2019) to modernize the dam safety statutes.

Under the new and existing statutes, and under the proposed rules, Oregon's Dam Safety Program determines each dam's hazard rating based on the potential threat to life and property, sets construction and maintenance standards, conducts dam inspections based on the dam hazard rating, and requires emergency action plans for high hazard dams.

Dams that are 10 feet or more in height and store more than 3 million gallons (9.2 acre-feet) of water are subject to the Dam Safety Program requirements and would be subject to these proposed rules.
Dams under the regulation of a federal dam safety program are not subject to these proposed rules. Of the approximately 950 dams under state jurisdiction, 76 dams are currently rated as high hazard, meaning loss of human life is expected should the dam fail, while approximately another 151 dams are rated as significant hazard, meaning failure is likely to result in damage to property or infrastructure. The more than 700 remaining dams regulated by the Department are low hazard dams. These numbers change based on ongoing analysis and changes to downstream risks, such as development within the inundation area below the dam. The hazard rating is not a reflection of the condition of the dam, but rather reflects the potential impacts of dam failure. A dam can be in satisfactory condition with a low risk of failure, and still be assigned a high hazard rating.

Portions of the statutes and rules are specific to dams with certain hazard ratings. For example, the requirement to submit an emergency action plan is only required for high hazard dams. Some of the provisions of the statutes and proposed rules do not apply to low hazard dams, such as maintenance and corrective actions sections, and submittal of plans for removals of dams.

Chapter 390, Oregon Laws 2019, continued, repealed or modified existing laws, as well as instituted new provisions for dam construction including increasing the height of dams; dam removal; impoundment of water or wastewater; coordination between owners, the Department and others; emergency actions; procedures regarding maintenance and corrective actions; civil penalties; and other actions related to the safety of dams.

Provisions of Chapter 390, Oregon Laws 2019, pertaining to dam safety are now codified in statute as ORS 540.443 to

540.491 and 540.995. The new law requires rulemaking in order to implement certain provisions, and also necessitates updates to existing dam safety rules to conform to the new law. As a result, the Department is conducting this rulemaking.

These rules were first opened for public comment on March 1, 2020. Due to the declaration of a state of emergency as a result of the COVID-19 pandemic, the resulting executive orders, and the need to practice social distancing, the public hearings were cancelled.

The Department is re-noticing these proposed rules and re-opening the public comment period for the following reasons:
(1) To provide the opportunity for oral comment during a teleconference public hearing. Due to the teleconference nature of the hearing, written comments are highly encouraged. Written comments and oral comments are given the same consideration.
(2) To correct errors in the original notice by: including eight rules proposed to be repealed that were omitted from the first filing (-0023, -0025, -0029, -0150, -0200, -0300, -0350, -0500); correctly identifying rules as being amended instead of adopted; correcting the numbering of OAR 690-020-0250, which was incorrectly identified as OAR 690-0020-0210; correcting missing periods and spaces; correcting some rule numbering; and clarifying some of the rule summaries and statutory citations.
(3) To update the statement of need and the fiscal and economic impact, in consideration of comments submitted during the first public comment period by a member of the rules advisory committee.

Members of the public that have already submitted public comments do not need to resubmit comments. All comments received between March 1 to April 6, 2020 will be considered and incorporated into the record. Changes to the rules based on consideration of public comment received between March 1 to April 6, 2020, and between May 1 to May 29, 2020, will be completed in June.

DOCUMENTS RELIED UPON, AND WHERE THEY ARE AVAILABLE:

Oregon dam safety database https://apps.wrd.state.or.us/apps/misc/dam_inventory/

Model dam safety program; Association of State Dams Safety Officials and Federal Emergency Management Agency https://www.fema.gov/media-library/assets/documents/14133

Geotechnical Engineering of Dams. Fell, R., G. Bell, D. Stapledon, and P. MacGregor. Balkema Publishers. 2005. Available for review at Oregon Water Resources Department in Salem.

FISCAL AND ECONOMIC IMPACT:

Dams provide a number of benefits such as controlling floods and capturing water for irrigation, municipal, recreation, fisheries, and other purposes. Oregon has adopted a dam safety program to prevent failures which can result in significant economic losses, and preserve the benefits, which can have positive economic impacts. Agriculture, cities, individuals, businesses, and industries require water and store it to support direct and underlying economic activities. In addition, properly maintained dams can increase the value of a property. However, there are costs to owners associated

with properly constructing, maintaining, operating, and removing a dam. The Department cannot estimate all of the costs that an owner may incur, because the costs will often be specific to the dam, how the owner chooses to comply with the rules, and the costs of engineering, labor, and other materials. The Department has identified the potential types of costs an owner may incur in this notice.

These proposed rules continue and, in some cases modify, the existing rules for department review and approval of the design of new dams, inspection of dams, emergency action plans for high hazard dams, and actions to respond to unsafe dams. New provisions describe the steps the Department and owners take concerning needed maintenance or corrective actions, modifying the dam height, as well as for removals of high or significant hazard dams, and civil penalties. The rules also address emergency action plans that are required for all high-hazard dams, including the requirements contained in an emergency action plan. The rules identify actions that must be taken during an emergency at a significant or high hazard dam.

These rules require individuals constructing a new dam or modifying the dam height to hire an engineer, and to submit and receive approval for plans and specifications. Dam owners will incur costs to hire an engineer to develop these required documents, and as the construction or modification proceeds.

The new dam safety statutes and these rules authorize the department to charge a fee for the examination of the proposed dam site, plans and specifications and other supporting information for the construction of a new dam or to modify the height of an existing dam. Individuals seeking to build a dam or modify the dam height may incur a new fee of up to $1,750 for a low hazard dam, $3,500 for a significant hazard dam, or $8,500 for a high hazard dam. The fee may be less if the cost of the Department's review is less than the maximum fee set by the new law. On average, six sets of plans for dam construction are submitted a year. Increased annual revenue to the department from the new fee is estimated to be between $15,000 and $30,000.

While owners of dams have been responsible for maintaining dams to prevent them from becoming unsafe, new provisions in the rules allow the Department to require action where maintenance issues on high and significant hazard dams have gone unaddressed. As a result, owners that have not maintained their dams, or in the future, do not maintain their dams, may see additional costs to undertake these maintenance actions. These costs may include or be associated with animal control, tree and brush control and removal, repairs to valves and pipes, equipment, mowing, cleaning spillways, and other activities. These costs cannot be estimated as they will depend on the specifics of the dam and the methods the owner chooses to use to meet these requirements. Some owners may not see an increase in costs associated with maintenance actions, if the owner already undertakes these activities and continues to do so; however, these owners will continue to incur costs associated with their ongoing maintenance activities. Since these provisions do not apply to low hazard dams, owners of low hazard dams will not incur increased costs associated with this provision.

The new dam safety statutes and these proposed rules provide a cooperative approach and a framework for addressing specific safety deficiencies associated with potentially unsafe and unsafe dams that are rated as high hazard or significant hazard. In these cases, the owner may need to hire a registered engineer to conduct the type of analysis needed to correct the deficiencies. In the short term, the cost of compliance will be the cost of an engineer or a specialist to conduct an analysis or develop a plan to repair. Engineering analysis to verify specific issues and develop solutions

can cost between $5,000 to several million dollars per dam, with limited additional planning costs for developing a corrective action timeframe. The costs to address safety issues will vary depending on the specific safety issue and the size of the dam and can range from a few thousand dollars to millions of dollars. These potential costs may be incurred by the owners of dams with a high or significant hazard rating, where the Department alleges that the dam is unsafe or potentially unsafe. Owners of potentially unsafe or unsafe dams will incur costs associated with addressing the deficiency. These costs will include engineering, labor, equipment, and materials, and may include attorney's fees for legal advice and representation. Owners of dams assigned a low hazard rating (the vast majority of dams) will not be required to hire engineers or other experts to address potentially unsafe or unsafe dams, as this portion of the laws related to corrective actions are inapplicable to low hazard dams.

No requirements as to removal of a dam previously existed. Under the proposed rules, owners or others seeking to remove a dam may incur costs associated with removal of a high or significant hazard dam in order to develop a removal plan, and also may incur costs associated with hiring an engineer in limited cases when the Department requires an engineer to be involved in the removal in order to protect public safety. The costs associated with developing a removal plan can range up to $30,000. These provisions do not apply to low hazard dams; therefore, owners of low hazard dams will not incur costs associated with this provision.

The statutes and these rules authorize the assessment of civil penalties for specific violations. However, if compliance is achieved by the specified date, civil penalties may not be assessed. The new laws set the maximum civil penalty between $500 and $2,000 per occurrence based on the type of violation. In some instances, each day or month the violation continues is a new occurrence, meaning that penalty amounts can accrue and become significant the longer an issue remains unaddressed. It is expected that assessment of civil penalties will occur infrequently. Civil penalties will be applied only when other efforts to achieve essential safety actions have been ineffective. Civil penalties will be assessed after voluntary compliance has been rejected by the owner, and there has been the opportunity and when requested, a formal hearing, followed by issuance of a formal order. Civil penalties are specific to a limited subset of the rules and are highest where there is a higher risk posed to lives below the dam. In cases where risk is high and owners fail to take actions to eliminate the high risk, civil penalties could be up to $2,000 per day while lives are at risk.

See the cost of compliance section for additional discussion on costs.

COST OF COMPLIANCE:

(1) Identify any state agencies, units of local government, and members of the public likely to be economically affected by the rule(s). (2) Effect on Small Businesses: (a) Estimate the number and type of small businesses subject to the rule(s); (b) Describe the expected reporting, recordkeeping and administrative activities and cost required to comply with the rule(s); (c) Estimate the cost of professional services, equipment supplies, labor and increased administration required to comply with the rule(s).

State agencies, cities, counties, special districts, individuals, and businesses who own dams or are proposing to build a new dam are subject to these rules if the dam is not under the jurisdiction of a federal dam safety program and the dam meets the height and volume thresholds for regulation by the department. Owners of dams may incur costs, discussed in more detail above and in sections below, under these proposed rules to construct, modify, maintain, remove, and repair dams; comply with Emergency Action Plans; undertake actions during an emergency at a dam; and to pay civil penalties if specified laws are violated. There are approximately 950 dams regulated by the Department and subject to these rules. Potential costs of compliance are described in the Fiscal and Economic Impact section above as well as in this section.

In regard to publicly owned dams, based on a review of the dam safety database, there are an estimated 66 publicly owned dams rated as high or significant hazard. Of these, it is estimated that 35 are owned by cities, 23 by special districts or public utilities, 5 by counties and 3 by state agencies. Nine of these 66 dams have known or suspected vulnerabilities that may put the dams into the potentially unsafe condition. Owners of these dams have already been informed of the condition of their dams, and many are in various stages of planning for corrective actions. The Department has not been able to identify the exact number of low-hazard dams that are publicly owned. Over time, there may be additional dams found to be unsafe or potentially unsafe. The existing dam safety statutes and the new statutes authorize enforcement action for dams that pose a threat to life and property. The department is unable to determine the cost as the cost will vary depending on the nature of the corrective action and size of the dam. As discussed above, addressing dam safety deficiencies may cost a few thousand dollars, while others can cost millions. Customers and patrons who rely on these reservoirs for drinking water, irrigation, and other purposes may experience rate increases.

There are 161 high and significant hazard dams regulated under the dam safety program that are privately owned. Of the 161 high hazard and significant hazard privately owned dams, an estimated 105 are owned by small businesses, mostly for farm and ranch use. The remaining 56 dams are owned by corporations, some of which may be small businesses, for manufacturing, industrial, or power generation uses; homeowner associations; or, by individuals for their personal uses. The Department has not been able to identify the exact number of low-hazard dams that are owned by small businesses.

More than 700 of the dams regulated by the Department are low hazard dams; the rules do not provide authority to order maintenance or corrective actions on low hazard dams. Some portions of the rules as described in this notice do apply to low hazard dams. The primary costs associated with complying with the rules for low hazard dams is the costs associated with submittal of required documentation related to the construction of a new dam or raising the dam height, fees, or violating provisions of the rules that may result in civil penalties. In addition, if development occurs below a dam, this may result in a change in the hazard rating of the dam to either significant or high hazard, and the owner may incur costs to comply with provisions applicable to high and significant hazard dams as a result.

Owners of dams, including small businesses, may incur costs under these rules related to annual dam safety fees as identified in statute; fees associated with the construction or modification of dam height; costs associated with hiring an engineer and other costs to construct, remove, repair, modify dam height, and maintain dams; creating and implementing Emergency Action Plans for high hazard dams; taking Emergency Actions; and paying civil penalties for certain violations. These potential costs are mostly applicable to high and significant hazard dams.

The annual fee for dam owners is not changed by these rules and currently costs $100 for a low hazard dam, $200 for a significant hazard dam, and $670 for a high hazard dam, as specified in statute.
Persons, including small businesses, wishing to construct a dam or increase the height of an existing dam would now be subject to a fee of up to $1,750 for a low hazard dam, $3,500 for a significant hazard dam, or $8,500 for a high hazard dam for review of designs of new dams or raising the dam height.

Dam owners, including small businesses, are required to notify the Department if the contact information changes, or

after completing a transfer of title on the dam. This should not result in costs to the owner. The owner should keep records to track conditions of the dam. The rule does not specify the types of records.

Dam owners or individuals seeking to construct a dam, including small businesses, may incur costs for professional services (including engineers, and in some cases, attorneys), equipment and supplies, and labor in order to undertake actions in these rules related the construction, maintenance, emergency action planning, operation, repair, or removal of a dam. In general, the Department cannot estimate the costs of these services as they will differ and be specific for each dam and, in some instances, based on the preferences of the owner. Individuals that seek to construct, maintain, repair, or remove a dam, or develop an emergency action plan will, in many cases, need to engage the services of a professional engineer, particularly for high or significant hazard dams.

The laws require the dam owner, including small businesses, to evaluate the conditions of the dam to keep it in good repair, maintained, and to address any conditions that may pose a risk of failure, and may incur labor costs. Dam owners should already be maintaining their dams under the existing laws in order to prevent them from becoming unsafe. However, the new statutes and these proposed rules allow the Department to require owners of high and significant hazard dams to take maintenance actions. Owners that have not been maintaining their dams may see an increase in the time or cost to undertake maintenance actions. Dam owners that have maintained their dams and continue to do so, will continue to incur costs associated with maintenance.

In addition, for high or significant hazard dams that are potentially unsafe or unsafe, many owners are already working towards improvements to those dams under the existing law or have restrictions on the amount of water that may be stored. The new law should not result in cost changes for owners to address dam safety deficiencies; however, under the new law and these proposed rules the Department has authority to work with owners to develop reasonable timeframes to address deficiencies, as well as to order action to be taken to address deficiencies. The statutes and these proposed rules also provide that in cases where there is an imminent threat for an unsafe dam, the Department may request timelier scheduling of a hearing. At the present time, there appears to be about 2 dams owned by small businesses that could be subject to a corrective action for a potentially unsafe condition. This number is likely to increase as additional assessment and analysis of dams is completed. As discussed in the fiscal and economic impact section above, these costs will vary depending on the dam and the specific risks to the dam. Dam owners of high and significant hazard dams may incur costs associated with responding to and addressing dam safety deficiencies for unsafe or potentially unsafe dams including labor, equipment, engineers, or attorneys.

Under the proposed rules, owners of high and significant hazard dams, including small businesses that wish to remove those dams, would need to have a removal plan reviewed by the Department. There is no fee for review of this plan, but there might be costs incurred to develop the plan. Owners of dams may incur costs for engineering associated with development of a plan, if required by the Department to hire an engineer. The costs associated with developing a removal plan can be up to $30,000 for a high hazard with an engineer doing the removal plan. Costs associated with the owner doing the removal plan, where possible could be significantly less.

For high hazard dams, the owner is also required to develop and file copies of the emergency action plan with the department, Office of Emergency Management, and the local emergency services agency where the dam is located. Owners of high hazard dams, including small businesses, are required to complete emergency action plans, and may be

requested to update them. Some owners of existing high hazard dams that have out of date emergency action plans may incur costs to update the emergency action plans. The costs of creating a new emergency action plan or updating an existing one will vary depending on whether the owner does the plan themselves, whether a current inundation analysis already exists, and whether any other work needs to be completed by an engineer. The estimated costs could range up to $50,000 if a consultant is used to do all of the work; costs would be less if the owner does the work themselves. Costs of filing the plans will include either the costs of copying or emailing the document.

In addition, the owner is required to report an actual or potential dam failure to the department and other entities if no emergency action plan exists. The rules require the dam owner, including small businesses, to take immediate action in times of imminent breach or an unsafe dam. Dam emergencies are rare, and the costs of preventing a failure will vary greatly depending on the specific nature of the failure conditions.

In addition, owners of high hazard dams, including small businesses, may incur civil penalties for failure to comply as discussed in the fiscal and economic impact section above. The new laws set the maximum civil penalty between $500 and $2,000 per occurrence based on the type of violation. In some instances, each day or month the violation continues is a new occurrence, meaning that penalty amounts can accrue and become significant the longer an issue remains unaddressed (for example, $2,000 per day).
Some owners may elect to hire an attorney to comply with the provisions of these rules and, if they decided to, would incur costs to do so.

See fiscal and economic impact section for additional discussion on fiscal impacts, which include costs of compliance.

DESCRIBE HOW SMALL BUSINESSES WERE INVOLVED IN THE DEVELOPMENT OF THESE RULE(S):

The rules advisory committee (RAC) included representatives of groups and entities that either are, or represent, small business dam owners, and also private engineers that work on dam design, rehabilitation and removal. These groups included individual entities that own dams, technical consultants and engineers, local governments, special districts, and the Oregon Farm Bureau. After the RAC met, the Department also continued to update and refine this notice in an attempt to respond to and address comments from one of the members of the RAC that is an owner of a dam.

WAS AN ADMINISTRATIVE RULE ADVISORY COMMITTEE CONSULTED? YES

RULES PROPOSED:
690-020-0000, 690-020-0022, 690-020-0023, 690-020-0024, 690-020-0025, 690-020-0026, 690-020-0028, 690-020-0029, 690-020-0035, 690-020-0036, 690-020-0037, 690-020-0038, 690-020-0041, 690-020-0042, 690-020-0043, 690-020-0044, 690-020-0047, 690-020-0048, 690-020-0055, 690-020-0060, 690-020-0065, 690-020-0068, 690-020-0070, 690-020-0080, 690-020-0100, 690-020-0120, 690-020-0140, 690-020-0150, 690-020-0160, 690-020-0180, 690-020-0200, 690-020-0250, 690-020-0260, 690-020-0300, 690-020-0310, 690-020-0340, 690-020-0350, 690-020-0400, 690-020-0410, 690-020-0420, 690-020-0460, 690-020-0500, 690-020-0600

AMEND: 690-020-0000

RULE SUMMARY: Amends existing rule to clarify the Water Resources Department's general responsibilities for Dam safety and for coordination with Dam owner, agencies, and others. Maintains exclusion from regulation for Dams that are not at least ten feet high and storing at least 3 million gallons of Water.

CHANGES TO RULE:

690-020-0000
Purpose and Applicability ¶

(1) The purpose of these Division 20 rules is to implement ORS 537.400(4) and ORS 540.350 40.443 through 491 and ORS 540.390 995 with actions that are intended to ensure the safety of the dDams, insofar as dDams may affect possible damage toloss of life or property. The Department is authorized to review design and specifications for dam construction and modification, to c, and damage to public infrastructure. Prioritization of Dam safety actions and requirements are based on the Hazard Rating of the Dam. These rules outline processes to:¶
(a) Review design and specifications to Construct a Dam;¶
(b) Review plans for removal of Significant Hazard and High Hazard Dams;¶
(c) Conduct routine inspections, and to take enforcement actions on dams that do not ensure the safety ofnotify Dam owners of outcomes;¶
(d) Cooperate with Dam owners over Dam safety issues;¶
(e) Prescribe Maintenance Actions, corrective actions, or any other actions necessary to protect life and, property .¶
(2) These rules apply to dams that are subject to ORS 540.350 through 540.390 and which exceed the height and storage limits described in ORS 540.400, or public infrastructure consistent with the Department's authorities and with law, and to pursue formal enforcement as necessary;¶
(f) Communicate, coordinate, and collaborate with Persons, Tribes, or other government entities regarding Dam safety; and¶
(g) Plan for and respond to emergencies as necessary and as consistent with law.¶
(32) These rules do not apply to:¶
(a) Dams that are less than ten feet hin Height or that storeimpound less than 3three million gallons (9.2 aAcre- feet), except for general guidance and permit requirements described in OAR 690-020-0029; or;¶
(b) Water storage tTanks or various types of tTanks that are part of wWater treatment facilities.; and¶
(4c) The dam safety fee authorized by ORS 536.050(2) shall be used to support the dam safety program as described inDams regulated under a federal Dam safety program, except as provided in ORS 540.446 and OAR 690-020-0200024.¶
(53) The State Engineer may delegate dam safety duties toCompliance with ORS 540.443 through 491 and these OAR Division 20 rules does not relieve the owner or operator of a Dam or an individual in immediate charge of a d Dam safety engineer working for the Department for the purposes of ORS 540.350 through 540.390from any duty, obligation, or liability regarding the ownership, maintenance, or operation of the Dam.
Statutory/Other Authority: ORS 540.350 - 540.400, 536.05036.027, 540.488
Statutes/Other Implemented: ORS 183, 540, 536540.446, 540.488, 540.491

AMEND: 690-020-0022

RULE SUMMARY: Amends existing rule to reference definitions used in 2019 Oregon Laws, Chapter 390 (ORS 540.443). Maintains existing definition of essential Dam and Dam safety terminology used in Division 20, with references to the statutory language for definitions defined in statute. Defines terms used in Division 20 rules.

CHANGES TO RULE:

690-020-0022
Definitions ¶

Unless the context requires otherwise, the following definitions apply in OAR Chapter 690, ~~d~~Division 20:¶
(1) "Abutment" means a natural valley or canyon side against which the ~~d~~Dam is built;¶
(2) "Acre-~~foo~~Feet" means the ~~equivalent volume of~~unit of volume equal to one acre covered with one foot of ~~w~~Water (325,900 gallons);¶
(3) "Annual Exceedance Probability Flood" means the likelihood of a specific flood flow being equaled to or exceeded in any given year at that specific location, expressed as a percentage;¶
(4) "As-built ~~d~~Drawing" means an engineering drawing of a ~~d~~Dam as it was actually constructed, noting all differences between original design and actual constructed condition;¶
(5) "Conduit" means a closed conveyance used to release ~~w~~Water through a ~~d~~Dam;¶
(6) "Core" means a soil of low permeability within an ~~e~~Embankment ~~d~~Dam;¶
(7) "Construct" has the meaning given to the term in ORS 540.443;¶
(8) "Cutoff Trench" means a trench excavated beneath the ~~d~~Dam ~~f~~Foundation and backfilled with low permeability material to retard ~~w~~Water seepage;¶
(~~8~~9) "Dam" ~~means a hydraulic structure built above the natural ground grade line that is used to impound water. Dams include all appurtenant structures, and together are sometimes referred to as "the works." Dams include wastewater lagoons and other hydraulic structures that store water, attenuate floods, and divert water into canals~~has the meaning given to the term in ORS 540.443;¶
(~~9~~10) "~~Dam~~ Crest" means the top of the ~~d~~Dam;¶
(1~~0~~1) "~~Dam~~ Height" means the maximum ~~h~~Height of the ~~d~~Dam above natural ground as measured at the maximum section along the ~~d~~Dam's longitudinal axis;¶
(1~~1~~2) "Dam Failure" has the meaning given to the term in ORS 540.443;¶
(13) "Department" means the Oregon Water Resources Department;¶
(1~~2~~4) "Director" means the Director of the Oregon Water Resources Department;¶
(1~~3~~5) "Embankment" means an engineered earth fill;¶
(1~~4~~6) "Emergency Action Plan" ~~(EAP) means a plan that assists the dam owner or operator and local emergency manager perform actions that ensure the safety of people in the event of a potential or actual dam failure or in the event of a sudden release of water;~~or "EAP" has the meaning given to the term in ORS 540.443;¶
(17) "Engineer" means an individual who is registered in this state and holds a valid certificate to practice engineering in this state as provided under ORS 672.002 to 672.325.¶
(1~~5~~8) "Engineer of Record" means ~~the~~a professional engineer registered in Oregon ~~working for the dam owner to~~ retained by a Dam owner to analyze, plan, and design ~~the d~~a Dam to current safety standards ~~and is responsible~~, to oversee safe construction of a Dam, to supervise Modification or removal of a Dam, or to oversee ~~safe construction~~corrective actions identified by the Department, ~~of~~r ~~the d~~o otherwise administer activities for a Dam;¶
(1~~6~~9) "Foundation" means the ground surface upon which a ~~d~~Dam is constructed;¶
(~~17~~20) "Freeboard" means the vertical distance between the high-water level in the reservoir and the ~~d~~low spot on the Dam ~~c~~Crest;¶
(2~~1~~8) "Gate" or "Valve" means a permanent device for regulating ~~w~~Water flow through the ~~d~~Dam;¶
(~~19~~22) "Hazard Rating" means the ~~rating~~categorization of a Dam established by the Department ~~of~~based on the potential damage to life ~~and~~, property, or public infrastructure downstream of a ~~d~~Dam in the event of a ~~d~~Dam ~~f~~F

ailure;¶
(2~~0~~3) "High Hazard Rating" ~~means that if a dam were to fail, loss of human life would be expected~~or "High Hazard" has the meaning given to the term in ORS 540.443;¶
(2~~1~~4) "Inflow Design Flood" ~~(~~or "IDF~~)~~" means ~~a volume and~~the peak flood flow that the ~~e~~Engineer of ~~r~~Record will design to safely pass over or through the ~~s~~Spillway;¶
(2~~2~~5) "Low Hazard Rating" or "Low Hazard" means that if a ~~d~~Dam were to fail, loss of life would be unlikely, and damage to property or public infrastructure would not be extensive;¶
(2~~3~~6) "~~Pressurized Conduit" means any pipe that penetrates into a dam that may have a gate, valve~~Maintenance Action" has the meaning given to the term in ORS 540.443;¶
(27) "Modification" means changes to a Dam which have a potential impact on the safety of the Dam and also do not conform to the original design, but do not include changes to Dam Height, performing Maintenance Actions, or removing a Dam;¶
(28) "Person" includes individuals, c~~or irrigation pipe placed in the dam or at the outlet so that all or a portion of the pipe within the dam is under hydrostatic pressure when the valve is closed~~porations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, the federal government and any agencies thereof, Tribe(s) and tribal members;¶
(29) "Potentially Unsafe" has the meaning given to the term in ORS 540.443;¶
(30) "Pressurized Conduit" means any pipe that penetrates into a Dam so that there is hydrostatic pressure due to the location of a Gate, Valve, or pipe connection;¶
(2~~4~~31) "Probable Maximum Flood" ~~(PMF) i~~or "PMF" means the largest flood that could occur at a specific location, determined by the most severe set of atmospheric, soil moisture, and snowpack conditions that are reasonably possible at that location;¶
(3~~2~~5) "Significant Hazard Rating" ~~means that if a dam were to fail, loss of life would be unlikely but damage to property would be extensive~~or "Significant Hazard" has the meaning given to the term in ORS 540.443;¶
(2~~6~~33) "Soil Filter" means soil with a gradation designed to inhibit movement of adjacent, finer grained soils;¶
(2~~7~~34) "Spillway" means a~~n~~y structure constructed to bypass Water, including flood water ~~and~~s, to prevent ~~w~~Water overtopping the ~~d~~Dam ~~c~~Crest~~. Dams may have two or more spillways.~~¶
~~(28) "State Engineer" means a registered professional engineer working for;~~¶
(35) "State Engineer" means an Engineer employed by the Department~~, and may be~~ that is either the ~~D~~director or a principal assistant working for the ~~D~~director as described in ORS 536.032~~.~~:¶
(2~~9~~36) "Tank" means a fully-enclosed (bottom and sides) hydraulic structure made from metal, reinforced concrete, rigid fiberglass, or plastic that provides its own ~~w~~Water-sealing and structural stability~~.~~:¶
(3~~0~~7) "Toe Drain" is a drainage structure designed to collect and remove seepage ~~w~~Water from the toe of the ~~d~~Dam and to discharge this ~~w~~Water in a manner where it can be measured;¶
(3~~1~~8) "Unsafe" has the meaning given to the term in ORS 540.443;¶
(39) "Water" means water or wastewater;¶
(40) "Zoned Embankment" means an ~~e~~Embankment ~~d~~Dam with a ~~c~~Core of low permeability materials, ~~s~~Soil ~~f~~Filter materials, drainage, and other materials placed to improve performance and safety of the ~~d~~Dam.
Statutory/Other Authority: ORS ~~183~~536.027, 540.488
Statutes/Other Implemented: ORS ~~183 & 540, 536~~540.443

REPEAL: 690-020-0023

RULE SUMMARY: Rule repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0023~~
~~Dam Safety Process Requirements for Construction of Dams~~
~~(1) Dam safety requirements shall be based on the hazard rating of the dam, in order to efficiently protect life and property.¶~~
~~(2) Any person, corporation, association, firm, partnership, limited liability company, joint stock company, unit of local government as defined in ORS 190.003, or State agency must, before beginning any construction on a dam, secure the services of a qualified engineer to design the dam and also to provide information on the dam as it was actually constructed. This engineer shall be deemed the engineer of record for the purposes of these rules.¶~~
~~(3) The engineer of record shall design the dam and develop plans and specifications consistent with these rules.¶~~
~~(4) Prior to beginning construction on any dam subject to these rules, written approval of dam designs, drawings and specifications must be obtained from the State Engineer as described in OAR 690-020-0080.¶~~
~~(5) The engineer of record must oversee construction of the dam consistent with rules governing administration of dam construction in OAR 690-020-0065 to evaluate whether the dam is constructed consistently with approved plans and specifications. Any essential design changes must be described and justified in a letter sent to the State Engineer with the "as-built" drawings.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 543~~

ADOPT: 690-020-0024

RULE SUMMARY: This new rule describes Department statutory authorities for regulation, intergovernmental coordination, accepting monies, limited actions on federal dams, and accepting reports.

CHANGES TO RULE:

690-020-0024
General Department Authorities and Intergovernmental Coordination
In addition to any other powers of the Department, in carrying out its duties, functions, and powers, under these rules and ORS 540.443 through 491 and 540.995, the Department may:¶
(1) Enter into contracts, memorandums of understanding and intergovernmental agreements for the inspection, evaluation or study of Dams, or the response to Dam Failure or potential Dam Failure.¶
(2) Accept moneys from any public or private source for the administration and enforcement of these rules for enhancing the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.¶
(3) Coordinate with federal, Tribal, state, local, and private entities to enhance the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.¶
(4) Waive or reduce fees for Dams inspected by another state agency under a memorandum of understanding with the Department.¶
(5) Aid in the inspection of a Dam and provide advice and assistance to prevent, mitigate, or respond to a potential or actual Dam Failure if there is a potential or actual risk of Dam Failure at a Dam regulated under a federal Dam safety program.¶
(6) Accept the reports of consulting Engineers, engineering geologists or other specialists employed by the Dam owner.¶
(7) Employ consulting Engineers, engineering geologists, or other specialists to make special examinations and inspections, and to prepare reports for the Department if the Department concludes that existing reports are insufficient. The cost of such special examinations, inspections, and reports shall be paid by the Department, or upon mutual agreement, may be divided between the Department and the Dam owner.
Statutory/Other Authority: ORS 540.488, 536.027
Statutes/Other Implemented: ORS 540.488, 540.446, 540.464

REPEAL: 690-020-0025

RULE SUMMARY: Repeals existing rule that is no longer needed due to updates to other rules and to conform with 2019 Oregon Laws, Chapter 390.

CHANGES TO RULE:

~~690-020-0025~~
~~General Requirements~~
~~(1) The Director may require additional information or data beyond that specified in these rules to determine the safety of a proposed dam.¶~~
~~(2) The Director may include, as part of any permit to construct a dam, limitations and conditions that pertain to construction, operation, maintenance, and the protection of lives and property. These limitations and conditions become, by reference, part of the water right certificate and remain in effect throughout the life of the water right.¶~~
~~(3) Approved plans and specifications for construction are, by reference, considered limitations and conditions placed on the water right permit and water right certificate. The Director retains the authority to place additional limitations and conditions on the water right relative to operation and maintenance.¶~~
~~(4) Dams constructed or operated in violation of limitations and conditions included in the water right permit or certificate are subject to restricted use. The certificate affirms the applicant's right to store water subject to the limitations and conditions therein.¶~~
~~(5) For new dams on stream channels, an outlet conduit must be installed to permit drainage of all or most of the reservoir and for passage of flow to downstream, instream and out of stream water right holders or instream minimum releases unless the engineer of record provides another alternative and demonstrates the safety and efficacy of this alternative to the State Engineer.¶~~
~~(6) The Department shall determine water impoundment volumes in acre-feet as follows:¶~~
~~(a) For dams impounding water for an authorized beneficial use, the impoundment volume indicated in the area-capacity curve as measured from the bottom of the reservoir to the spillway crest. For dams with multiple spillways, spillway crest' is referring to the crest of the lower elevation spillway.¶~~
~~(b) For wastewater treatment lagoons, the impoundment volume is that indicated in the wastewater lagoon plans and specifications.¶~~
~~(c) For diversion or flood control dams, the impoundment volume is that calculated at full reservoir at the dam highest elevation spillway crest level.¶~~
~~(7) The State Engineer may approve final designs, drawings and specifications for water storage reservoirs after a water storage application and a draft final order for that application have been issued by the Department.¶~~
~~(8) Any person, firm or private or municipal corporation must provide to the State Engineer an evaluation of whether the dam includes measures that make it readily adaptable to power generation for any new dam over 25 feet high on a stream with average annual flow over 2 cubic feet per second, unless exempted from this requirement as provided in ORS 540.350(3).¶~~
~~(9) For any dam rated high hazard, the Department must review and approve an Emergency Action Plan prior to filling the reservoir.¶~~
~~(10) For any dam rated high or significant hazard, the Department must review and approve an operations and maintenance manual prior to construction on the dam.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 543~~

ADOPT: 690-020-0026

RULE SUMMARY: Describes administration of newly authorized fees for review of Dam construction documents. Describes annual Dam safety program fees.

CHANGES TO RULE:

690-020-0026
Fees
(1) The Department may charge a fee for examination of the site, plans and specifications, features, and other supporting information regarding construction of a new Dam or construction to modify Dam Height. The fee, as provided in ORD 540.449 Oregon Laws 2019, must be paid prior to final design approval and may not exceed the lesser of the costs of providing the examination or the amounts provided in ORS 540.449 (3).¶
(2) Dam owners subject to the Department's laws governing Dam safety shall submit to the Department an annual fee based upon the Dam's Hazard Rating as provided in ORS 536.050 (2) to support the Dam Safety Program and administration expenses.¶
(a) Dam owners who fail to pay the annual fee on or before six months after the billing date may be required to pay a late fee as provided in ORS 536.050 (2).¶
(b) If a Dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the Dam owner notice by certified mail, place a lien on the real property where the Dam is located for the fees owed by the Dam owner.¶
(c) Multiple Dams directly adjacent to each other and connected together and separated only by Embankments or other manmade materials will be considered as one Dam for the purpose of determining annual fees.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.449, 536.050

ADOPT: 690-020-0028

RULE SUMMARY: This rule describes initial submittal information for dams, where this is required and where it is advised.

CHANGES TO RULE:

690-020-0028
Preliminary Plans and Specifications for Construction of New Dams or to Increase Dam Height
(1) If a Dam requires a Water right, preliminary plans and specifications must be submitted to the Department at the time an application to appropriate Water is submitted to the Department pursuant to ORS 537. Preliminary plans and specifications are recommended for Dams that do not require a Water right.¶
(2) Preliminary plans and specifications must include the following at a minimum:¶
(a) A contour map of the reservoir site showing the proposed location of the Dam. The map should be no smaller than eleven inches by seventeen inches. The map must show the proposed location of the Spillway(s) and the Conduit inlet and outlet;¶
(b) Written description of the proposed Dam location both as Latitude/Longitude and Township/Range/Section;¶
(c) A cross section of the proposed Dam at the maximum section indicating the proposed Height;¶
(d) The proposed storage of the reservoir in Acre-Feet; and¶
(e) A brief description of geologic conditions of the proposed site. Any geologic features that could impact the safety of the Dam should be clearly described.¶
(3) The preliminary plans and specifications must be submitted by an Engineer, or a certified engineering geologist that is registered in the State of Oregon and is also a Certified Water Rights Examiner.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 537.400

REPEAL: 690-020-0029

RULE SUMMARY: Rule repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0029~~
~~Recommendations for Dams Under 10 Feet High or Storing less than 9.2 Acre-feet~~
~~(1) Persons constructing or designing dams under ten feet high or storing less than 9.2 acre feet may be subject to requirements for use of registered engineers as specified in ORS 672.002 through 672.091.¶~~
~~(2) The Department is authorized to provide guidance for the construction of dams requiring a water right permit but not requiring State Engineer review and approval of designs, plans and specifications.¶~~
~~(3) Potential dam owners are advised that even small dams, should they fail, may cause injury to people and property. Dam owners should consider designs and inundation analysis methods described in OAR 690-020-0035 through 690-020-0065, 690-020-0100, and 690-020-0120.¶~~
~~(4) Persons proposing to build a dam under 10 feet high or storing less than 9.2 acre-feet must comply with all the requirements for a storage permit in ORS 537.409 and in OAR 690-310.~~
~~Statutory/Other Authority: ORS 183, 540~~
~~Statutes/Other Implemented: ORS 183, 540~~

AMEND: 690-020-0035

RULE SUMMARY: Describes design submittal requirements for engineers' submission of plans, specifications, and other documents for new construction and to increase height of existing dams.

CHANGES TO RULE:

690-020-0035
Minimum Engineering ~~Design Requirements~~ Requirements for Final Design of New Dams or to Increase Dam Height ¶

(1) ~~A design r~~No Person may build a new Dam or increase Dam Height unless the Depo~~a~~rt ~~or multiple design reports must be submitted with the drawings~~ment has first examined the site, plans and specifications, features, and other supporting information as prepared by an Engineer regarding the construction and ~~s~~ope~~cifications~~ration of the dam¶
(2) Final documents must be submitted by the ~~e~~Engineer of ~~r~~Record ~~for all new dam~~prior to construction. Design reports may be completed by ~~other engineer~~Engineers other than the Engineer of Record. If multiple reports are ~~gistered to practice in Oregon.~~ submitted, each must be stamped by the Engineer who prepared the report.¶
(3) Final documents shall include:¶
(a) A plan for construction administration as provided in OAR 690-020-0065;¶
(~~2~~b) ~~The design report(s) for new dam construction~~An operations and maintenance plan if required by OAR 690-020-0350;¶
(c) An Emergency Action Plan for Dams rated High Hazard as provided in OAR 690-020-0400;¶
(d) Final design drawings as provided in OAR 690-020-0055; and¶
(e) Final design reports.¶
(4) The final design report(s) must include the following elements:¶
(a) Site suitability evaluation as provided in OAR 690-020-0036;¶
(b) Hydrology and ~~i~~Inflow ~~d~~Design ~~f~~Flood as provided in OAR 690-020-0037;¶
(c) Dam structure design ~~(embankment, concrete or other)~~ as applicable and as provided in OAR 690-020-0038 - 690-020-0041;¶
(d) Spillway design as provided in OAR 690-020-0042;¶
(e) Design for penetrating ~~c~~Conduit(s) as provided in OAR 690-020-0043; ~~and~~¶
(f) M~~ethods~~onitoring and instrumentation for determining whether a ~~d~~Dam is operating properly based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam as provided in OAR 690-020-0044 ~~(monitoring and instrumentation).~~; and¶
(~~3~~g) ~~If multiple reports are submitted, each must be stamped by the engineer who prepared the report and the engineer of record must compile and understand reports for preparation of drawings and specifications~~A Dam Breach Inundation Analysis as provided in OAR 690-020-0120.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0036

RULE SUMMARY: This is an existing rule with minor changes to existing rule language for clarity. Provides minimum technical standards for investigation and design of geotechnical and geologic issues for dams. Specifies different standards based on Dam hazard rating (risk to persons, property, and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0036
Design Requirements for New Dams or to Increase Dam Height: Site Suitability and/or Geotechnical Evaluation ¶

The design for construction of a new dDam constructionor to increase Dam Height shall characterize the soil and rock at and around the dDam site and shall include the following elements:¶
(1) A description of the general and local geology and geomorphology at and around the dproposed Dam and reservoir. site.¶
(a) Field investigation by a geotechnical eEngineer and/or engineering geologist or both is required for all hdams rated High hHazard. For dams and also for srated Significant hHazard dams, field investigation by a geotechnical engineer or engineering geologist or both is required where landslides, faults, dispersive soils, or liquefiable soils could reasonably be expected near or at the dDam site. All such features shall be shown on a map of the dDam site, and be described as necessary for design of the dDam.¶
(b) For dDams on rock,located on rock, a drawing must also contain mapping of discontinuities relevant to the safety of the dDam and include evaluation of twhe need fother grouting is required.:¶
(2) SA subsurface investigation to determine the distribution of relevant earth materials. This investigation, which shall include borings or test pits; identification of springs, seeps, and groundwater encountered at the dDam site; and evaluation of the potential for landslides into the dDam or reservoir.:¶
(a) All materials shall be logged by the Unified Soil Classification System; blow counts (for borings only); and include a description of samples taken for testing.¶
(b) Subsurface investigations for High Hazard dDams shall include drilling to a minimum depth of 1.5 times the h Dam Height of the dam or at least 10ten feet into bedrock, whichever is less.¶
(3) Soil and or rock evaluation andAn evaluation of soil and rock and the testing of relevant materials. This evaluation, which may include: proctor compaction testing from all borrow areas;, estimation or testing the permeability of soils to be used in dDam construction;, and an assessment for the presence of dispersive soils. There must be a sufficient number of tests to characterize the variability in each borrow area. In addition, an evaluation must contain the following information as applicable and as may be required by the State Engineer:¶
(a) An analysis of materials in the fFoundation and proposed eEmbankment shall be completed if materials are prone to liquefaction or significant settlement.¶
(b) Where suitable materials can be collected, strength tests shall be required for all hHigh hHazard dDams, and may be required by the State Engineer for sSignificant hHazard dDams.¶
(c) Testing of dynamic soil properties may be required for hHigh hHazard dDams in areas with large ground acceleration potential from earthquake loading, if soils have potential for significant strength loss upon seismic loading.¶
(4) Borrow area locations. Areas proposed for borrow shall be identified and shown on the drawings.:¶
(5) Earthquake considerations. Seismic site characterization is required for hHigh hHazard dDams, and may be required for sSignificant hHazard dDams. A seismic site characterization shall include earthquake sources, ground motion hazard, peak ground acceleration, and recommended ground motions (time histories).; and¶
(6) Site preparation criteria. The site evaluation shall recommend a depth of stripping unsuitable materials, and also a minimum, and where necessary, maximum depth for the cCutoff tTrench.
Statutory/Other Authority: ORS 540.350 -36.027, 540.40088
Statutes/Other Implemented: ORS 183, 536540.449, 540.488

AMEND: 690-020-0037

RULE SUMMARY: This is an existing rule with minor changes to existing rule language. Provides minimum technical standards for design of hydrologic parameters for dams. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0037
Design Requirements for New Dams or to Increase Dam Height: Hydrology and Inflow Design Flood ¶

The design for construction of a new Dam or to increase Dam Height shall characterize flow into and through the reservoir and ~~d~~the Dam and shall include the following elements:¶
(1) A topographic map delineating the drainage area contributing to the ~~d~~Dam, with the drainage area size labeled in square miles and showing the specific location of the proposed ~~d~~Dam.~~:~~;¶
(2) For ~~d~~Dams on stream channels, the name of the stream where the ~~d~~Dam is located, the name of the principal watershed, and a determination of average annual inflow into reservoir and potential to fill the reservoir~~:~~.¶
(3) ~~Dam failure inundation analysis is required for any dam that might be high or significant hazard. The inundation analysis shall comply with OAR 690-020-0120.¶~~
~~(4) The i~~The Inflow ~~d~~Design ~~f~~Flood that is the basis of hydraulic design for the ~~d~~Dam shall be determined based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam~~.~~ as follows;¶
(a) The ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~h~~High ~~h~~Hazard ~~d~~Dam is the Probable Maximum Flood (PMF) unless the Engineer of Record proposes to determine an Inflow Design Flood based on a quantitative analysis of risk to people.¶
(b) The minimum ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~s~~Significant ~~h~~Hazard ~~d~~Dam is the 0.2 percent ~~a~~Annual ~~e~~Exceedance ~~p~~Probability ~~f~~Flow.¶
(c) The minimum ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~l~~Low ~~h~~Hazard ~~d~~Dam is a 1.0 percent ~~a~~Annual ~~e~~Exceedance ~~p~~P robability ~~f~~Flow.¶
(d) The ~~i~~Inflow ~~d~~Design ~~f~~Flood for a lagoon or off channel reservoir is the maximum capacity of inflow pumps~~,~~ or ditches plus the maximum local storm precipitation over the lagoon~~.~~;¶
(e) For watersheds under ~~30~~thirty square miles, the ~~e~~Engineer of Record may consider just the 24-hour storm to help determine the PMF, while for larger basins the ~~e~~Engineer of Record shall utilize at least a 72-hour storm for calculating the PMF for a general storm.¶
~~(5) For a high hazard dam, the engineer of record may also propose to determine an inflow design flood based on a quantitative analysis of risk to people and property.¶~~
(~~6~~4) Designs shall include a description of all hydrologic parameters and the method used to determine the ~~i~~Inflow ~~d~~Design ~~f~~Flood hydrograph and the volume of the ~~i~~Inflow ~~d~~Design ~~f~~Flood, which is to be determined considering basin size and other factors as appropriate to the watershed above the ~~d~~Dam~~.~~; and¶
(~~7~~5) The design report must include the information used to develop the stage and storage capacity curve for the reservoir, including the capacity with and without excavation for construction.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0038

RULE SUMMARY: This is an existing rule with minor changes to rule language for clarity. Provides minimum technical standards for design of embankment structures. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0038
Design Requirements for New Dams or to Increase Dam Height: Embankment Dam Structures ¶

Designs for construction of a new Dam or to increase Dam Height for Embankment (soil ~~and~~ or rock) ~~d~~Dams shall include the following elements:¶
(1) A determination of ~~e~~Embankment stability and stable ~~e~~Embankment slope angles~~.~~ as follows:¶
(a) Embankment ~~d~~Dams shall be designed to have stable slopes during construction, and under all conditions of reservoir operation.¶
(b) Standard slopes of 3:1 upstream and 2:1 downstream may be used at the discretion of the ~~e~~Engineer of ~~r~~Record for ~~l~~Low and ~~s~~Significant ~~h~~Hazard ~~d~~Dams as long as low strength materials are not used in the ~~e~~Embankment and conditions leading to elevated pore ~~w~~Water pressures are not present.¶
(c) ~~Dams that are rated h~~For High ~~h~~Hazard ~~must be designed as zoned embankment dams and/or include a chimney drain designed also as a filter.¶~~
~~(d) High hazard dams shall be analyzed for~~Dams, an analysis of static and seismic slope stability, and ~~also for~~of deformation ~~analysis~~. The State Engineer may require static and ~~or~~ seismic slope stability analysis for ~~s~~Significant ~~h~~Hazard ~~d~~Dams. At a minimum, seismic analysis shall be based on full reservoir under steady state seepage conditions. Factors of safety shall be evaluated by slope stability analyses using appropriate strength parameters based on laboratory or in situ testing. For materials that can be reasonably tested either on site or in a laboratory, soil strength values may not be based on assumptions and must be made on strength testing of the appropriate soil or rock units.¶
(~~e~~d) High Hazard ~~d~~Dams shall be designed for the maximum credible earthquake. If the State Engineer requires seismic analysis of a ~~s~~Significant ~~h~~Hazard ~~d~~Dam, deformation analysis shall be designed for the 0.2 percent ~~a~~Annual ~~e~~Exceedance ~~p~~Probability earthquake~~.~~; and¶
(~~f~~e) Abrupt changes in depth of compressible ~~f~~Foundation material shall be identified and where present, the design shall prevent significant differential settlement.¶
(2) Analysis of seepage and leakage expected through the ~~d~~Dam and design of measures to prevent internal erosion and excess leakage~~.~~ as follows:¶
(a) Steady state seepage and internal drainage conditions beneath, around and through the ~~d~~Dam shall be quantified for all ~~h~~High ~~h~~Hazard ~~d~~Dams, and may be required by the State Engineer for ~~s~~Significant ~~h~~Hazard ~~d~~Dams~~.~~;¶
(b) A ~~c~~Core of low permeability material protected by a ~~s~~Soil ~~f~~Filter is required for all ~~h~~High ~~h~~Hazard ~~d~~Dams. A ~~c~~Core and ~~s~~Soil ~~f~~Filter is required for any ~~s~~Significant ~~h~~Hazard ~~d~~Dams where the ~~e~~Engineer of ~~r~~Record or State Engineer determines piping could potentially occur. All ~~c~~Core and filter zones must be of a configuration with dimensions that can be readily constructed~~.~~;¶
(c) Internal drains and~~/or s~~ Soil ~~f~~Filters shall be used as needed to drain ~~w~~Water and prevent internal erosion of the ~~d~~Dam. Toe ~~d~~Drains shall be standard design practice for ~~w~~Water storage ~~facilitie~~Dams, but not for most wastewater lagoons~~.~~; and¶
(d) Internal drain pipes to collect and distribute seepage flows from internal filters and drains shall be comprised of material that is non-corrodible, designed to carry the overburden load, and be no smaller than 6 inches in diameter.¶
(3) A safe and accessible ~~d~~Dam ~~c~~Crest~~.~~ as follows:¶
(a) The ~~d~~Dam ~~c~~Crest shall be of sufficient width to be accessible by equipment and vehicles for emergency operations and maintenance, and shall have a road to allow ~~c~~Crest access during periods when the ~~s~~Spillway is

flowing.;¶
(b) The cCrest shall have a camber sufficient to maintain the design fFreeboard, based on the anticipated cCrest settlement, and in no case shall the camber be less than 0.5 feet.;¶
(c) Roads located on the dDam cCrest shall have appropriate surfacing to provide a stable base that resists rutting and provides adequate traction for access and safety in wet conditions.; and¶
(d) The cCrest shall have adequate cross slopes to prevent ponding.¶
(4) Measures to control wave and surface erosion as needed.follows:¶
(a) For reservoirs large enough to generate significant waves, the design shall include a determination of minimum fFreeboard based on expected waves. The design shall also include slope protection for wave action if significant waves are likely.; and¶
(b) The downstream slope shall be provided with a well maintained cover of non-woody vegetative cover, or a gravel or rock surface, to prevent surface erosion. No woody vegetation shall be planted on the dam during the life of the structure unless specifically designed by the engineer of record, by demonstrating that cover plants will not affect critical dam functions.
Statutory/Other Authority: ORS 540.350 - 536.027, 540.400 488
Statutes/Other Implemented: ORS 183, 536 540.449, 540.488

AMEND: 690-020-0041

RULE SUMMARY: This is an existing rule with minor changes to existing rule language for clarity. Provides minimum technical standards for design of concrete structures. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0041
Design Requirements for New Dams or to Increase Dam Height: Concrete Dam Structures ¶

Designs for construction of a new Dam or to increase Dam Height for concrete mass ~~d~~Dams must be prepared by a structural ~~e~~Engineer and a geotechnical ~~e~~Engineer ~~and/~~or engineering geologist. This rule does not apply to concrete flashboard ~~d~~Dams. Designs for all other concrete ~~d~~Dams shall include the following elements as applicable:¶
(1) Concrete ~~d~~Dams shall be specified as gravity, arch, arch-gravity, or buttress. Gravity ~~d~~Dams can be of conventional mass concrete or roller compacted concrete~~.~~;¶
(2) Dams shall be designed to be stable during construction and under all conditions of reservoir operation~~.~~;¶
(a) Headwater and tailwater elevations pertinent to the design shall be described with respect to both static and dynamic loading~~.~~;¶
(b) Uplift pressure distributions assumed for design shall be provided~~.~~; and¶
(c) When ~~f~~Foundation drains are used to reduce uplift, the assumed drain efficiency shall be indicated and permanent access shall be provided at the project to inspect and maintain the drains.¶
(3) Sliding stability shall be evaluated at lift joint surfaces, at the ~~d~~Dam ~~f~~Foundation interface, and at discontinuities in the ~~f~~Foundation materials beneath the ~~d~~Dam and ~~a~~Abutments~~.~~;¶
(a) Factors of safety shall be based on limit equilibrium methods.¶
(b) For earthquake loadings, ~~the critical acceleration (acceleration required to initiate sliding) may be less than the peak ground acceleration of the design earthquake. In such cases~~ a permanent sliding displacement ~~shall~~may be determined in lieu of a sliding factor of safety~~.~~; and¶
(c) Overturning of the ~~d~~Dam on its ~~f~~Foundation shall be evaluated for static and seismic loading.¶
(4) Seismic stability analysis ~~is~~may be required for ~~certain c~~Concrete ~~d~~Dams and if required shall demonstrate the ~~d~~Dam can withstand the design earthquake without loss of life or damage to property~~.~~ or public infrastructure;¶
(a) High ~~h~~Hazard ~~d~~Dams shall be designed for the maximum credible earthquake based on current information from the US Geological Survey or a site specific seismic evaluation. A dynamic stress analysis that considers the dynamic characteristics of the ~~d~~Dam and the ground motions of the design earthquake shall be provided for ~~h~~High ~~h~~Hazard ~~d~~Dams~~.~~; and¶
(b) Where the State Engineer requires seismic analysis on ~~s~~Significant ~~h~~Hazard ~~d~~Dams, they shall be designed for the 0.2 percent ~~a~~Annual ~~p~~Probability of ~~e~~Exceedance earthquake. The Department may require a dynamic stress analysis for ~~s~~Significant ~~h~~Hazard ~~d~~Dams.¶
(5) When ~~f~~Foundation grouting is needed, the design for the grout curtain and~~/or~~ consolidation grouting of the ~~f~~Foundation shall be ~~requir~~described~~.~~;¶
(6) ~~Specific properties of mass~~Any property essential for the structural design of the concrete ~~t~~shat ~~can be important to design and construction include the~~ll be included in the design documents. These may include but are not limited to compressive strength (at ~~28~~twenty-eight days and one-year), modulus of elasticity, Poison's ratio, shear strength, tensile strength, volume change during drying, thermal coefficient of expansion, specific heat, thermal conductivity, permeability and durability~~.~~;¶
(a) As a minimum for static loadings, the assumed compressive and shear strengths for the parent concrete, lift joint surfaces, and the ~~d~~Dam-~~f~~ Foundation contact shall be provided.¶
(b) In addition, tensile strength assumptions for the aforementioned regions for dynamic loadings (seismic) shall also be provided~~.~~; and¶
(c) Air entraining agents shall be provided in the concrete mix to provide freeze-thaw protection and to improve

the workability of lean mass concrete mixes. The quantity of air entrained in mass concrete shall be in the order of ~~5~~five percent.¶
(7) Mix design and construction methods used to minimize cracking due to temperature gradients between interior regions subject to heat of hydration effects and surfaces exposed to ambient temperatures shall be specified. Treatment of lift joint surfaces to achieve desired shear and tensile strengths shall be indicated. Treatment of contraction joints to prevent leakage ~~and/~~or to transfer load between adjacent monoliths shall be described~~.~~;¶
(8) When reinforcing steel is used, the strength properties of the reinforcement shall be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements~~.~~; and¶
(9) The minimum ~~c~~Crest width must be ~~15~~fifteen feet unless otherwise approved. The ~~d~~Dam ~~c~~Crest and appurtenant structures shall be accessible by equipment and vehicles for emergency operations and maintenance.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.488, 540.449

AMEND: 690-020-0042

RULE SUMMARY: This is an existing rule with minor changes to existing rule language related to spillways for off-channel dams. Provides minimum technical standards for design of Dam spillways. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0042
Minimum Design Requirements for New Dams or to Increase Dam Height: Spillways ¶

~~All d~~(1) Dams on stream channels and all High Hazard Rated Dams must have a ~~s~~Spillway.¶
(2) Spillway(s) design for construction of a new Dam or to increase Dam Height shall include the following minimum elements:¶
(~~1~~a) Utilization of ~~i~~Inflow ~~d~~Design ~~f~~Flood. Determination of ~~i~~Inflow ~~d~~Design ~~f~~Flood as described in OAR 690-020-0037 is required to determine the required ~~s~~Spillway capacity.¶
(~~2~~b) Hydraulic evaluation of flow through control section. Flood flow through the control section must be calculated and the minimum ~~f~~Freeboard at the ~~i~~Inflow ~~d~~Design ~~f~~Flood must be ~~1~~one foot for ~~h~~High ~~h~~Hazard ~~d~~Dams and ~~2~~two feet for ~~s~~Significant and ~~l~~Low ~~h~~Hazard ~~d~~Dams.¶
(~~3~~c) Optional low elevation ~~s~~Spillway. An interior ~~s~~Spillway connected to the low level ~~c~~Conduit may be used for ~~l~~Low and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, and for ~~h~~High ~~h~~Hazard ~~d~~Dams only with specific approval by the State Engineer. The capacity of the low elevation ~~s~~Spillway may be considered in design of the overflow ~~s~~Spillway.¶
(~~4~~d) Stable ~~s~~Spillway control section. The ~~s~~Spillway control section must be hydraulically and structurally stable for the ~~i~~Inflow ~~d~~Design ~~f~~Flood and have permanent features so that the control section is identifiable for re-measurement of cross section during routine inspections.¶
(~~5~~e) Spillway channel stability. Spillways shall be designed to be structurally adequate and stable under all conditions of reservoir operation. Spillway structures of ~~h~~High ~~h~~Hazard ~~d~~Dams shall be designed for earthquake ground motions per OAR 690-020-0036.¶
(~~6~~f) Reinforced concrete specifications for spillways. Structural elements of reinforced concrete shall be designed for both strength and serviceability. The ~~28~~twenty-eight day strength of structural concrete shall be provided. The strength properties of the reinforcing materials shall also be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements. Treatment of construction joints and contraction/expansion joints shall be described and special provisions for strength transfer and leakage prevention identified. Air entrainment shall be provided in cast-in-place concrete if needed for freeze-thaw protection, durability, and workability.¶
(~~7~~g) Debris booms. For ~~h~~High and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, debris or log booms may be required. Where required, they shall be designed for the ~~s~~Spillway approach where logs and other debris may block or damage the ~~s~~Spillway structure. The design shall specify the necessary anchor capacity, and the design of the anchors.¶
(~~8~~h) Gates and Flashboards. Detailed drawings and specifications are required for ~~s~~Spillway ~~g~~Gate structures or flashboards, if present on the proposed ~~d~~Dam. Operations and maintenance ~~manual~~plans are required for any ~~d~~Dam with a ~~g~~Gated ~~s~~Spillway, or where flashboards or stop-logs are used in the ~~s~~Spillway as per OAR 690-020-0350.¶
(~~9~~i) Energy dissipation. The design of stilling basins for ~~h~~High ~~h~~Hazard ~~d~~Dams, and where required by the State Engineer for ~~s~~Significant ~~h~~Hazard ~~d~~Dams, shall be based on calculated hydraulic forces and designed to dissipate energy from the ~~i~~Inflow ~~d~~Design ~~flood~~Flood.¶
(3) Low and Significant Hazard Dams constructed off channel are not required to have a Spillway, if redundant mechanisms to prevent overfilling are included in the design.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0043

RULE SUMMARY: This is an existing rule with minor changes to existing rule language for clarity. Provides minimum technical standards for design of conduits through dams. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0043
Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit(s) and Control of Flow ~~T~~through Conduits ¶

~~All n~~New ~~d~~Dams on stream channels must have a low level ~~c~~Conduit. All other ~~dams~~new Dams and Dams with increases to Dam Height must have a low level ~~c~~Conduit or other means to safely drain the reservoir. The ~~c~~Conduit and related control structures must be designed to meet the following criteria:¶
(1) Ability to lower the reservoir. The minimum diameter of the ~~c~~Conduit should be determined through analysis of the time required to drain the ~~d~~Dam at average annual inflow~~.~~:¶
(a) The ~~c~~Conduits for ~~h~~High ~~h~~Hazard ~~d~~Dams shall be capable of releasing the amount of Water which could be stored in the top five feet of the reservoir in five days.¶
(b) The ~~c~~Conduits for ~~s~~Significant and ~~l~~Low ~~h~~Hazard ~~d~~Dams must be able to release the amount of Water which could be stored in the top five feet of the reservoir in ten days.¶
(c) All ~~c~~Conduits must be of sufficient size to allow passage of inflows as needed.¶
(d) In no case shall ~~c~~Conduits be smaller than ~~8~~eight inches in diameter.¶
(2) Durable and water-tight ~~c~~Conduits. Conduits must be made of medium to heavy gage durable materials. Pipe joints must be designed to seal and prevent leakage. Corrugated metal culverts are only acceptable for ~~l~~Low ~~h~~Hazard ~~d~~Dams, and only when the ~~c~~Conduits are encased in concrete. Encasement of ~~c~~Conduits in concrete may be used to assist in the design of a durable ~~c~~Conduit and to reduce the potential for seepage and erosion adjacent to the ~~c~~Conduit~~.~~:¶
(a) Diaphragms using materials designed as an effective ~~s~~Soil ~~f~~Filter are required for any ~~c~~Conduits not designed as encased in concrete, and are required regardless of encasement for all ~~h~~High ~~h~~Hazard ~~d~~Dams.¶
(b) Seepage collars may not be used in any ~~d~~Dam.¶
(3) Control Mechanisms. The design for the control mechanism must be sturdy~~,~~ and durable~~.~~. The control mechanism must allow for air venting when needed, and allow manual operation to drain the reservoir if hydraulic or other power controls are inoperable. Hydraulic or other power controls must have redundancy if control relies on any submerged hydraulic ~~hose~~or pneumatic hoses or electrical conduits. Intake structures for outlet works must have trash racks unless the ~~e~~Engineer of ~~r~~Record shows trash racks are unnecessary, or ~~u~~Unsafe to ~~c~~Construct due to conditions at the ~~d~~Dam site. For ~~h~~High and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, measures to prevent unauthorized use of the control mechanism must be included in this design~~.~~:¶
(4) Outlet structure. The outlet structure must not be submerged when the inlet control ~~g~~Gate or ~~v~~Valve is fully closed. The outlet structure must be designed to protect the ~~c~~Conduit from mechanical damage and convey ~~w~~Water to the stream channel without channel erosion and cavitation near the ~~g~~Gate structure~~.~~: and¶
(5) Pressurized operation. Conduits must be specified as suitable for pressurized operation if they are to be operated with controls other than at the inlet of the ~~conduit. Conduits for d~~Conduit. Dams with ~~p~~Pressurized ~~c~~Conduits shall have a guard ~~g~~Gate installed at the upstream end of the ~~c~~Conduit. Operations and maintenance ~~manual~~plans are required for any ~~d~~Dam designed for pressurized operation~~, and the plans must include procedures for periodic inspections of the interior of any pressurized pipes~~s per OAR 690-020-0350.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0044

RULE SUMMARY: This is an existing rule with minor changes for clarification only. Provides minimum technical standards for design of instrumentation for general monitoring dams. Specifies different standards based on Dam hazard rating (risk to persons, property and public infrastructure) should a Dam fail.

CHANGES TO RULE:

690-020-0044
~~Monitoring and Instrumentation~~ Design Requirements for New Dams or to Increase Dam Height: Instrumentation for Monitoring ¶

Designs must include methods for determining if the ~~d~~Dam is operating properly based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam, and include:¶
(1) A plan to share monitoring data with the Department¶
(2) Staff gage near controls for the ~~c~~Conduit or where they can be easily seen by the Dam owner or operator. The staff gage shall be clearly marked in feet and tenths of feet, and extend to within one foot of the ~~crest of the dam~~ Dam Crest. Markings and numbers on the gage rod shall be of sufficient size to be easily readable from the ~~crest of the dam.~~Dam Crest;¶
(~~2~~3) Multiple and easily accessible outlets of all ~~t~~Toe ~~d~~Drains. Toe ~~d~~Drains shall be designed to discharge into locations where flows can be evaluated and monitored. Multiple discharge points are required in order to isolate seepage to various sections of the ~~d~~Dam and ~~f~~Foundation. Discharge points must be located where routine ~~d~~Dam maintenance is not likely to damage the drains.~~:~~;¶
(a) For ~~h~~High ~~h~~Hazard ~~d~~Dams, drains must have a measuring weir or other device, and a basin for settling drainage ~~w~~Water so that internal erosion can be identified.¶
(b) Where drainage galleries are provided for concrete ~~d~~Dams, seepage measuring devices should be provided and accessible for making the necessary readings.¶
(~~3~~4) Unique Identification. All instrumentation and exterior drains shall be labeled with a unique identifying marker designed for durability and to withstand maintenance activities.~~:~~; and¶
(45) All ~~h~~High ~~h~~Hazard and, whe~~re~~n required by the ~~e~~Engineer of ~~r~~Record or State Engineer, ~~s~~Significant ~~h~~Hazard ~~d~~Dams shall have the following instrumentation:¶
(a) Monuments that allow measurement of the horizontal and vertical movements of the ~~d~~Dam. Control or benchmark monuments shall be placed in areas not subject to movement~~:~~.¶
(b) Piezometers to allow monitoring of the phreatic surface within the ~~d~~Dam or for concrete ~~d~~Dams, to determine uplift pressures. Standpipe piezometers must be installed pursuant to monitoring well standards. (OAR 690-240-0525)¶
(c) Instrumentation to measure strong ground motions for ~~d~~publically owned Dams in locations where the peak ground acceleration in the 0.2 percent annual probability of exceedance earthquake is greater than 0.4~~g~~3g at the ground surface.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0047

RULE SUMMARY: This is an existing rule with minor changes to existing rule language for clarification only. Geosynthetics are excluded from certain uses in dams.

CHANGES TO RULE:

690-020-0047
Design Requirements for New Dams or to Increase Dam Height: Geosynthetics-
Geosynthetics shall not be used as the sole element employed to perform a~~n essential d~~ Dam safety function. Redundant design features are required whenever geosynthetics are used for ~~essential d~~Dam safety functions.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0048

RULE SUMMARY: This is an existing rule with no changes, other than to update the statutory authorities. Allows Engineers to adjust rule standards if demonstrated to be inapplicable to the dam.

CHANGES TO RULE:

690-020-0048
Modification of Standard Design Requirements ¶

Exceptions to design standards may only be obtained with written approval from the State Engineer. Where the ~~e~~ Engineer of ~~r~~Record requests design exceptions, the request must be in writing, be affixed with the e~~E~~ngineer of ~~r~~ Record~~'s~~ professional stamp, and include a report describing why design standards are inapplicable to the safety of the ~~d~~Dam.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0055

RULE SUMMARY: This is an existing rule with minor changes for clarity. Describes requirements for engineer's drawings, to allow Department review and approval.

CHANGES TO RULE:

690-020-0055
Design Requirements for New Dams or to Increase Dam Height: Design Drawings-
The ~~e~~Engineer of ~~r~~Record shall submit applicable drawings when the ~~e~~Engineer believes the design is ready for review and approval by the State Engineer.¶
(1) Drawings must accurately portray the work to be accomplished and be of sufficient detail to clearly define all features of the project. After all changes required by the State Engineer are made, final design drawings must be neatly and accurately drawn to a scale sufficiently large for the drawings to be readily interpreted.¶
(2) Drawings must be uncluttered and easy to understand for determination of design compliance by the contractor, the ~~e~~Engineer of ~~r~~Record, and the State Engineer.¶
(3) Drawings must be no larger than 24" X 36". Other acceptable sizes for drawings are 17" X 22" and 22" X 34". All drawings must have a graphic scale bar so that scale can be determined after enlargement or reduction. Each sheet shall be numbered sequentially with the first sheet being sheet number one along with the total number of sheets; e.g., 1 of 6.¶
(4) Drawings shall include the following information:¶
(a) An official ~~d~~Dam name, which must not have already been used for a ~~d~~Dam as indicated in the Oregon ~~d~~Dam ~~s~~Safety ~~d~~Database. This unique name must be affixed on each drawing;¶
(b) The first drawing must include a location map with the drainage basin, the ~~d~~Dam and reservoir, streams within the drainage area, and the location of the nearest access highway. This drawing must include legal location of the ~~d~~Dam ~~(~~including Section, Township and Range~~)~~, and the location of the survey reference point with latitude, longitude, elevation, and datum elevation ~~(~~in NAVD1988~~)~~;¶
(c) A contour map of the reservoir site showing the legal location of the ~~d~~Dam with a contour interval no greater than ~~5~~five feet. A plan of the ~~d~~Dam should be superimposed on this map. If scale permits, this drawing should show the location of the ~~s~~Spillway(s), ~~c~~Conduit inlet and outlet, and the location, distance and direction to a government land corner or other permanent survey marker;¶
(d) A~~rea and storage capacity curves and information on the hydrology of~~n area capacity curve showing the total capacity to the ~~proposed reservoir drainage area in square miles~~top of the Dam, with the Spillway Crest elevation identified. Surface area and storage capacity curves must be in acres and Acre-Feet, respectively;¶
(e) A profile of the ~~d~~Dam site at the center of the ~~d~~Dam;¶
(f) A cross section of the ~~d~~Dam at maximum section;¶
(g) Plan view(s) of ~~d~~Dam at maximum section, and other sections as needed;¶
(h) Cross section(s) of ~~d~~Dam, including the maximum section with the official ~~d~~Dam ~~h~~Height;¶
(i) Spillway details, ~~s~~Spillway approach control discharge, and energy dissipation;¶
(j) Low level ~~c~~Conduit details, including diameter, material, encasement; and¶
(k) Slide ~~g~~Gate or ~~v~~Valve details including the trash rack, control stem, pedestal and wheel, or other control details, and air vent.¶
(5) Elevations must be clearly labeled on applicable drawings and include the:¶
(a) Base of ~~d~~Dam and official ~~height of dam~~Dam Height;¶
(b) Dam ~~c~~Crest;¶
(c) Spillway control section;¶
(d) Base of ~~s~~Spillway discharge; and¶
(e) Invert of the ~~c~~Conduit at both the inlet and outlet.¶
(6) All drawings must be dated and have sufficient space for State Engineer's approval stamp, at least 3" x 3" near the lower right hand corner of the drawing.¶
(7) Drawings must be designated as final design drawings or ~~a~~As-built ~~d~~Drawings.

Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0060

RULE SUMMARY: This is an existing rule with minor changes for clarity. Describes minimum information in engineers' submittal of specifications to allow Department review and approval.

CHANGES TO RULE:

690-020-0060
Design Requirements for New Dams or to Increase Dam Height: Construction Specifications ¶

All drawings for ~~d~~Dams must be accompanied by construction and material specifications that include the following:¶
(1) Construction conditions. Specifications must include the construction period based on typical weather ~~for that location and in-stream work periods~~and stream conditions for that location and if applicable, ~~and~~ may include a process for the ~~e~~Engineer of ~~r~~Record to modify the construction period.¶
(2) Clearing of the ~~d~~Dam site and reservoir. Specifications must include the area to be submerged by the new or enlarged reservoir and specify that the submerged area shall be cleared of logs and debris prior to filling the reservoir. The specifications must require that the footprint of the ~~d~~Dam shall be cleared of all soils containing organic materials, and that this material may not be used for ~~d~~Dam construction.¶
(3) Cutoff ~~t~~Trench requirements. Specifications must include the minimum trench depth, width at base of the trench, and maximum side slope steepness. These specifications shall be based on the subsurface investigations and direct that the ~~c~~Cutoff ~~t~~Trench may not be filled if it contains standing ~~w~~Water. ~~A~~Specifications must also include a requirement not to begin filling the ~~c~~Cutoff ~~t~~Trench until approved by ~~e~~Engineer of ~~r~~Record, and where specified, ~~by State Engineer or Dam Safety Engineer, must also be includ~~approved ~~in~~by the ~~specifications~~ Department.¶
(4) Material specification standards. The specifications shall include material and testing specifications for ~~d~~Dam materials, ~~c~~Conduits, control structures, and other appurtenant structures, using an ASTM standard methodology if available.¶
(5) Soil Compaction. The typical compaction specification is ~~95~~ninety-five percent of standard proctor density, though the ~~e~~Engineer of ~~r~~Record may use a different compaction standard. Specifications shall include the types of acceptable compaction equipment, by material source if necessary. Specifications shall also include maximum lift thickness. ~~To reduce potential for leakage around the conduit, s~~Specifications shall prohibit soil compaction dry of optimum moisture content ~~f~~to reduce potential for leakage around the Conduit. For materials placed immediately above or adjacent to the ~~c~~Conduit. ~~S~~, specifications must also include verification testing of soils, with representative samples selected for testing as directed by the ~~e~~Engineer of ~~r~~Record ~~and not the contractor~~. Specifications must also require verification of testing of soil compaction, with representative samples selected for testing by the Engineer of Record, or Engineer's representative.¶
(6) Concrete placement. Specifications shall include means to prevent separation of aggregate and cement, air entrainment requirements if needed, methods for placement and vibration of concrete, required minimum ~~28~~ twenty-eight day strength, slump, moisture and temperature requirements for curing. Alkali reactive aggregate shall not be used in the concrete.¶
(7) Conduit specifications. Specifications must include the material, diameter, and thickness of the ~~c~~Conduit, and the length of ~~c~~Conduit required for the project. Methods for sealing joints must be specific. Specifications must require that all materials from a manufacturer are certified to meet this test, or that the ~~e~~Engineer of ~~r~~Record has tested the materials directly.¶
(8) Accepting and Rejecting Materials. Specifications must include tolerances for acceptable departure from material specifications and a process for rejection of defective materials or workmanship.¶
(9) Notification by the ~~e~~Engineer of ~~r~~Record to the State Engineer of changed conditions critical to the safety or operations of the ~~d~~Dam. Specifications shall include State Engineer notification if previously unidentified springs, slope movement or sand lenses are identified, or if storm or other damage occurs during construction.¶
(10) The ~~specifications must require supervision by the engineer of record during construction and for inspection~~

~~by the Director or Director's authorized representative at any time during the construction period~~Engineer of Record or their qualified employees must supervise construction as needed to assure compliance with the approved construction plans and specifications.¶
(11) The specifications must also contain a provision to the effect that plans or specifications shall not be altered or changed without the written approval of the State Engineer.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

AMEND: 690-020-0065

RULE SUMMARY: This is an existing rule with changes to clarify these requirements are provisions to be included in plans for administering dam construction. Describes minimum information in Engineers plan for Dam construction to allow Department review and approval.

CHANGES TO RULE:

690-020-0065
~~Dam Construction~~ Plan Requirements for New Dams or to Increase Dam Height: Construction Administration ¶

(1) The Engineer of ~~r~~Record shall submit plans for administering the construction of the ~~d~~Dam to the State Engineer for approval. Construction plans must include the following:¶
(~~1~~a) ~~Construction of the dam shall be observed and documented by the engineer of record and employees working for the engineer of record as applicable.¶~~
~~(2) T~~A provision stating that the ~~e~~Engineer of ~~r~~Record or an ~~inspector~~employee working for the ~~e~~Engineer of ~~r~~Record shall be on-site as needed for instructions to the contractor, approval of initial excavation, acceptance of materials, and general project administration.¶
(~~3~~b) ~~T~~A provision stating that the ~~d~~Dam owner shall cease construction activity if the ~~e~~Engineer of ~~r~~Record is no longer ~~employ~~retained or for any reason cannot complete necessary construction administration activities. Construction may resume when a new ~~e~~Engineer of ~~r~~Record is employed, the State Engineer has been notified of the new ~~e~~Engineer of ~~r~~Record, and both ~~e~~Engineers have discussed the project.¶
(~~4~~c) ~~T~~A provision stating that the ~~e~~Engineer of ~~r~~Record ~~shall observe~~is responsible for the construction of the ~~d~~Dam~~. It is the engineer of record's responsibility to mak~~ consistent with approved design and construction documents. This provision should describe periodic inspections to evaluate whether the construction is proceeding in accordance with the approved plans and specifications~~. T~~ and describe how the ~~e~~Engineer of ~~r~~Record ~~shall endeavor~~will take actions to prevent defects and deficiencies in the construction of the ~~d~~Dam and ~~appurtenant structures, and shall disapprove or reject~~require work identified that fails to conform to ~~the approved plans and~~ specifications be corrected.¶
(~~5~~d) ~~The e~~A provision stating that the Engineer of ~~r~~Record shall confirm ~~f~~Foundation design assumptions once surface materials have been stripped and the ~~c~~Cutoff ~~t~~Trench excavated. Changes in actual ~~f~~Foundation conditions from assumptions made in the initial site evaluation shall be communicated to the ~~Department.~~State Engineer¶
(~~6~~2) ~~T~~A provision in which the ~~e~~Engineer of ~~r~~Record shall maintain a record of construction that shall include:¶
(a) Logs of construction inspections whenever such inspections are made by the ~~e~~Engineer of Record or the ~~e~~Engineer of Record's employee;¶
(b) All test results pertaining to construction;¶
(c) Photographs; and¶
(d) Construction problems and remedies.¶
(~~7~~3) ~~The e~~A provision stating that the Engineer of ~~r~~Record shall complete and stamp As-built ~~d~~Drawings and a final construction report, including statements that the observations are either consistent or inconsistent with the design drawings and specifications. If key elements of construction were not observed, the construction report shall detail those specific elements that were not observed.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.449, 540.488

ADOPT: 690-020-0068

RULE SUMMARY: Replaces similar rule that will be repealed. Describes minimum elements needed in Operations and Maintenance manuals submitted with design information, to allow Department review and approval.

CHANGES TO RULE:

690-020-0068
Plan Requirements for New Dams or to Increase Dam Height: Operations and Maintenance Plan
(1) The Engineer of Record shall include an operations and maintenance plan with the submittals for construction of:¶
(a) Any Dam rated Significant or High Hazard; and¶
(b) Any Low Hazard Dam with:¶
(A) A Gate or flashboard as part of the Spillway; or¶
(B) A Valve on a Conduit that is not on the upstream side of the Dam.¶
(2) The Department may review implementation of the operations and maintenance plan during Dam safety inspections.¶
(3) Operations and maintenance plans shall include, but are not limited to:¶
(a) Directions for filling and emptying the reservoir when needed;¶
(b) Frequency of inspection of the interior of Conduits, including qualifications and guidance for Persons conducting and reporting on this inspection;¶
(c) Procedures for operation of all Gates and Valves;¶
(d) Specified minimum frequency for cycling and lubrication of all Gates and Valves;¶
(e) Standards for removal of trees and brush, and mowing other vegetation; including the frequency for the Dam owner to monitor vegetation and to take action to control brush if it obscures any face of the Dam, the Conduit or the Spillway;¶
(f) Frequency of routine Dam observations, including identification of changes in seepage and maximum permissible Dam deformations;¶
(g) A Water release plan in the event of a flood forecast when reservoir is above a certain level;¶
(h) The measurement frequency for all monitoring instrumentation installed at the Dam; and¶
(i) Review and evaluation of conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, including actions identified in [OAR 690-0250].
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.449, 540.488

AMEND: 690-020-0070

RULE SUMMARY: This is an existing rule with changes for clarity. Describes all elements needed in engineers submittals of documents needed for new Dam construction or modification to increase Dam height, to allow Department review and approval.

CHANGES TO RULE:

690-020-0070
New Dams or to Increase Dam Height: Submittals and Notifications by the Engineer of Record ¶

(1) ~~When necessary, t~~The ~~e~~Engineer of ~~r~~Record must include an inundation analysis that complies with OAR 690-020-0120 prior to submitting the design report, plans and specifications and other documents, so that the Department can determine the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam.¶
(2) All final designs, drawings and specifications submitted to the State Engineer for approval must be prepared and stamped by a ~~professional engineer licensed to practice in the State of Oregon~~n Engineer. The first page of the drawings, the specifications, and the construction administration plan must be stamped by the ~~e~~Engineer of ~~r~~R ecord. All submitted materials must be addressed directly to the State Engineer and labeled as a ~~d~~Dam safety submission.¶
(3) Final drawings shall be submitted on full size paper. The design reports and specifications must be submitted as packaged 8.5 x 11 inch bound documents, with ~~essential~~ maps folded within.¶
(4) For High Hazard rated Dams, the final Emergency Action Plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the Engineer of Record prior to commencing construction.¶
(~~4~~5) A schedule of construction ~~wi~~shall be provided to the State Engineer prior to initiating construction of any ~~s~~S ignificant or ~~h~~High ~~h~~Hazard ~~d~~Dam.¶
(~~5~~6) ~~Prior to completion of the cutoff trench and all stripping of foundation and embankments the e~~The Engineer of ~~r~~Record shall notify the State Engineer to allow for ~~State Engineer inspection of the excavation~~Department inspection of the excavation prior to completion of the Cutoff Trench and all stripping of Foundation and Embankments. The required notice to the State Engineer is as follows:¶
(a) 48-hours for a ~~l~~Low ~~h~~Hazard ~~d~~Dam;¶
(b) 120-hours for a ~~s~~Significant ~~h~~Hazard ~~d~~Dam; and¶
(c) ~~for high hazard dams,~~ 240-hours or the time specified in the approval, whichever is longer for High Hazard Dams.¶
(~~6~~7) Any changes made to the designed location, ~~h~~Height or width of the ~~d~~Dam, or to materials used in ~~d~~Dam construction shall be reported in writing immediately to the State Engineer.¶
(~~7~~8) ~~If a~~Any slope instability is observed during construction in the ~~e~~Embankment or adjacent to the ~~d~~Dam or into reservoir, it shall immediately be reported to the State Engineer by phone.¶
(~~8~~9) ~~If for any reason the engineer of record ceases construction administration work, t~~The ~~e~~Engineer of ~~r~~Record must immediately notify the State Engineer ~~o~~if the ~~situation, by phone and in writing.¶~~
~~(9) For high hazard rated dams, the final emergency action plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the e~~y are no longer the Engineer of ~~r~~Record ~~prior to or concurrent with submission of the as-built drawings and the project completion report~~. The notification shall be by phone and in writing.¶
(10) The ~~e~~Engineer of ~~r~~Record must submit ~~as-built drawings and~~ a project completion report upon completion of the Dam. A project completion report must include the following:¶
(a) As-built ~~d~~Drawings~~, i.~~ If possible ~~on the same sheet as the initial design drawings.~~, As-built ~~d~~Drawings shall be ~~submitted in the form of electronic copies of all applicable drawings;¶~~
~~(b) A completion report stating either~~on the same sheet as the initial design drawings;¶
(b) Sufficient information to document that the ~~d~~Dam has been built according to the drawings with changes to improve safety as documented in the ~~a~~As-built ~~d~~Drawings, or that ~~essen~~critical safety functions are unknown;¶

(c) A list of the da~~y~~tes the ~~e~~Engineer of ~~r~~Record was on site, the number and location of material tests, and observations of all changed conditions;¶
(d) ~~Test~~Material testing results (compaction, strength, permeability)~~ must be summarized in the completion report;¶~~
~~(e) The completion report must document the o~~;¶
(e) Observations and decisions made and communicated to the contractor or ~~d~~Dam owner.~~:~~;¶
(f) Photographs of key stages of construction, including but not limited to photographs of the ~~c~~Cutoff ~~t~~Trench, borrow pit development, trenching and placement of the ~~c~~Conduit, the ~~s~~Spillway before and after placement of concrete; and¶
(~~f~~g) The ~~project completion report shall be stamped by~~signed professional stamp of the ~~e~~Engineer of ~~r~~Record.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.488, 540.449

AMEND: 690-020-0080

RULE SUMMARY: Describes process for determination of design requirements for construction other than for new dams or to increase Dam height.

CHANGES TO RULE:

690-020-0080
New Dams, or to Increase Dam Height, Written Approval by State Engineer ¶

(1) ~~Prior to commencing construction activity, all design reports, drawings of the dam and critical appurtenant structures, specifications, and plans for construction administration must be approved by~~No person shall Construct a Dam unless the State Engineer has ~~indicated by the State Engineer's stamp and a written letter of approval from the State Engineer.~~¶
~~(2) The State Engineer's approval of design plans and specifications shall be valid only for five years. Upon request, written requests for time extensions may be granted in writing~~reviewed all necessary reports, drawings, plans and other information as submitted by the ~~State~~ Engineer.~~¶~~
~~(3) The following activities which involve the construction or operation of an existing permitted dam that may impair the safety of the dam require State Engineer approval of engineered designs:¶~~
~~(a) Any changes that affect storage capacity of the dam or increase dam height above that in the approved drawings for the dam, including all dam rises other than adding fill to restore crest height lost to settlement or erosion;¶~~
~~(b) Any changes to or near the spillway that may affect spillway capacity or ability to pass flows safely;¶~~
~~(c) Installation of any valve or gate on the downstream side of the dam;~~ of Record and has approved those documents as indicated in written communication with the Engineer of Record.¶
(~~d~~2) ~~Removing and replacing or otherwise excavating into or near the dam to place or replace any conduit or utility in the dam;¶~~
~~(e) Replacement of the conduit control structure;¶~~
~~(f) Installation of any valve on the downstream side of the low level condu~~Prior to commencing construction activ ity, ~~or directly connecting irrigation pipe to the low level conduit;¶~~
~~(g) Repair of damage which has already significantly weakened the dam;¶~~
~~(h) Any activity where at least 30 percent of fill material in the dam is impacted by that activity; and¶~~
~~(i) Any other change to the dam that affects its safety as determined by the State Engineer.¶~~
~~(4) Prior written approval will not be required for replacement or lining of toe drains, relining of conduits of low hazard dams, and for specific actions required in a safety emergency. As-built drawings may be sent to the State Engineer after completion of such projects to show these projects have been completed in a safe manner~~the Engineer of Record shall verify that all necessary documents related to the final design are approved as indicated by the State Engineer's stamp on those documents.¶
(~~5~~3) ~~For pre-existing dams without a valid storage permit, t~~The State Engineer ~~may~~'s approveal of design plans and specifications s~~o that a permit may be issued only if the engineer of record provides the following:¶~~
~~(a) Drawings of the dam as it exists during the engineer's evaluation and survey of the dam. These drawings should include all the critical features as described in OAR 690-020-0035, except for those elements that cannot be evaluated such as the cutoff trench;¶~~
~~(b) Evaluation of any embankment distress, including erosion, seepage or leakage;¶~~
~~(c) Condition and function of the conduit and its controls, capacity and stability of the spillway;¶~~
~~(d) Any other safety information needed as determined~~hall be valid only for five years from the date of approval. Upon request, written requests for time extensions may be granted in writing by the State Engineer~~;~~.¶
(e4) ~~Designs as needed to bring the dam up to the current standards based on the hazard classification of that dam;¶~~
~~(f) As improved drawings of the dam showing that all necessary modifications have been made with a report from the engineer describing the necessary work that was completed; and¶~~

~~(g) The source of all information used to develop the as-improved drawings must be documented in a report submitted by the engineer. This includes but is not limited to the engineer's measurements, engineer's observations, a photographic record, and testimony of individuals.¶~~
~~(6) No newly constructed dam~~No newly constructed Dam or Dam that has had Height modified may store ~~w~~Water until final written a~~pproval of necessary plans, specifications or other information is received from the Department.¶~~
~~(a) Final approval may be obtained only after construction has been completed and as-built drawings and~~ cceptance of a satisfactory project completion report ha~~ve~~s been submitted to and a~~pprov~~ccepted by the ~~State Engineer~~Department.¶
(~~b~~5) The ~~State Engineer~~Department shall notify the ~~e~~Engineer of ~~r~~Record and ~~d~~Dam owner in writing when the final ~~documents~~project completion report ha~~ve~~s been ~~approved~~received and accepted by the Department.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.488, 540.449

AMEND: 690-020-0100

RULE SUMMARY: This is an existing rule with minor changes to existing rule language. Provides minimal technical criteria for establishing Dam hazard ratings. Provides general information on setting and revising Dam hazard ratings.

CHANGES TO RULE:

690-020-0100
Hazard Rating of Dams ¶

(1) ~~Dams~~The Department shall ~~be~~ assign~~ed a h~~ all Dams a Hazard ~~r~~Rating of ~~h~~High, ~~s~~Significant, or ~~l~~Low.¶
(2) ~~The Department shall utilize dam breach inundation analysis as a primary factor to determine the hazard rating of dams as describ~~A High Hazard rating will be bas~~ed ~~i~~on ~~OAR 690-020-0120.¶~~
~~(3) Using~~ the ~~d~~Dam breach inundation analysis as described in OAR 690-020-0120~~, the Department shall make the final determination of any hazard rating~~ using the following criteria:¶
(a) An inundation depth of flowing ~~w~~Water of at least two feet over the finished floors of dwellings, other frequently occupied buildings, or road surfaces where a vehicle is likely to be present ~~establishes a "high hazard" rating.¶~~
~~(b) Any inundation depth of w~~. The Department may also consider Water ~~over the floorboards of structural buildings~~locity in its determination of inundation depth establish~~es a "significant h~~ing a High Hazard~~" r~~ Rating.¶
(~~c~~b) ~~For other roads and vulnerable utilities, an inundation depth of two feet or evidence of depth and velocity capable of creating damage establishes a "significant hazard" rating.¶~~
~~(d) Wherever heavy recreational or other frequent use occurs downstream a "high hazard" rating shall be established to prevent probable loss of life. Such designation shall not depen~~An incremental increase of depth of flowing Water of 1 foot where recreational or other frequent use occurs downstream to prevent probable loss of life. The Department will also use Water velocity in its determination of inundation depth establishing a High Hazard Rating.¶
(3) A Significant Hazard Rating will be based on the Dam breach inundation analysis as described ~~o~~in ~~the presence of downstream infrastructure.¶~~
~~(e) For water depths close to those listed in the subsections (a) and (c), the Department may also consider water velocity in its determination of hazard rating.~~OAR 690-020-0120, using depth and velocity of the flowing Water at affected structures, public infrastructure, and other properties which shows likely damage to property and infrastructure but no loss of life.¶
(4) Any Dam that is not rated as High or Significant by the Department will be rated as Low Hazard. ¶
(45) The ~~h~~Hazard ~~r~~Rating of a ~~d~~Dam shall remain in effect until the rating is revised by the Department ~~using the procedures described in OAR 690-020-0120. A dam owner may request that the Department revise a h~~. The Department may conduct Hazard Rating reviews and Dam Breach Inundation Analyses as evidence indicates the impacts to people, property, or infrastructure may have changed since the Hazard ~~r~~Rating was first set. The Dam owner ~~must provide information in support of the request and prepared by an engineer licensed in Oregon and familiar with hydraulic and hydrologic calcul~~will be notified of the change and have an opportunity to meet with the Department¶
(6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inunda~~s~~ation~~s~~ an~~d using the procedures described in OAR 690-020-0120~~alysis, in support of this request.
Statutory/Other Authority: ORS ~~183~~536.027, 540.488
Statutes/Other Implemented: ORS ~~183 & 536~~540.443, 540.488

AMEND: 690-020-0120

RULE SUMMARY: This is an existing rule with minor changes to existing rule language. Provides general information on Dam Breach Inundation Analysis. Provides minimum submittal requirements for Dam Breach Inundation Analysis.

CHANGES TO RULE:

690-020-0120
Dam Breach Inundation Analysis
(1) A dam breach inundation analysis must be submitted with the design for any new dam, except only for dams in a remote location far enough from buildings, high use recreation sites or high use public roads so that damage or fatalities from a dam breach would be very unlikely as determined by the State Engineer.¶
(2) A dam breach inundation analysis is required to change the hazard rating of an existing dam.¶
(3) Tny simplified and conservative hydraulic model may be used for the dDam breach inundation analysis must use a breach time based on dam materials and thickness and other factors that would influence the time it would take for the dam to breach from internal erosion, overtopping, or displacement.¶
(4) Any simplified and conservative hydraulic model may be used to show that a dto show that a Dam should be rated lLow hHazard. The State Engineer may determine if the model was used appropriately and conservatively.¶
(52) An accepted and hydraulically consistent computational models must be used to conduct the inundation analysis for sSignificant and hHigh hHazard dDams, as these will be used .¶
(3) A report summarizing the event of an emergency at the dam. Models developed by the US Army Corps of Engineers including HEC-RAS are the preferred methods of analysis. Omodel information and results must be stamped and submitted to the Department by the Engineer of Record. The summary report shall contain sufficient information to reproduce the model and shall include at a minimum the following information:¶
(a) The specific proprietary model name or method used for the analysis;¶
(b) Details regarding ther models that use hydrodynamic equations checked for minimum tolerances such as FLO 2D are also acceptable for conducting dam breach inundation analysis. Information on the specific model used for analysis, dam geometry;¶
(c) The specific mode of failure and any assumptions made in the selection of the mode of failure;¶
(d) A list of Dam breach parameters and any assumptions made in the selection of the breach parameters. The breach parameters and justification, and all assumptions made for the analysis must bemust be based on Dam material and thickness and any other factors that would incfluded in the documentation for the inundation analysis.ence the time it would take for the Dam to breach from internal erosion, overtopping, or displacement;¶
(6e) Inundation analysis for hazard rating of hA list of all boundary and initial conditions and any assumptions in the selection of these conditions. For High and sSignificant hHazard dDams, the analysis must be conducted with the reservoir at full pool and inflow equal to the 0.2 percent a% Annual eExceedance pProbability fFlood flow. The analysis must show on a map areas inundated;¶
(f) A map indicating the inundation boundary, areas inundated by a depth greater than 2 feet, and all frequently occupied structures.¶
(7) The that foallo wing additional information shall also bthin or are immediately adjacent to the inundation boundary;¶
(g) The brequired for newly constructed or modified high hazard rated dams.¶
(a) A sunny day and a PMF inflow analysis as part of the emergency action plan.¶
(b) The inundation mapping must include cross sections with depth and times to flood wave arrival, and must be extended downstream to a location where no significant property damage existach flow as calculated by the model immediately downstream of the Dam. If an empirical formula was used as the basis for determining breach flow, the formula and all inputs must be clearly stated; and¶
(h) A sensitivity analysis evaluating the variability in model inputs may be required when the Dam breach inundation analysis results indicate the Hazard Rating is on the border between two ratings.
Statutory/Other Authority: ORS 540.350 - 36.027, 540.40088
Statutes/Other Implemented: ORS 183, 536540.443, 540.488

ADOPT: 690-020-0140

RULE SUMMARY: Replaces a similar rule that is proposed for repeal. Provides the process the Water Resources Department will use to determine approval requirements for construction of dams that modify existing dams but do not increase the height of those dams.

CHANGES TO RULE:

690-020-0140
Modification of Dams
(1) No person shall Modify a Dam unless the State Engineer has reviewed all required documents as described in the following sections and has approved those documents as indicated in written communication with the Engineer of Record or Dam owner.¶
(2) The following Dam modifications require State Engineer approval of plans:¶
(a) Any changes to or near the Spillway that may affect Spillway capacity or ability to pass flows safely;¶
(b) Placing, replacing, or relining any Conduit or utility in the Dam;¶
(c) Replacement of the Conduit control structure;¶
(d) Installation of any Valve on the downstream side of the low level Conduit, or directly connecting a pipe to the low level Conduit;¶
(e) Repair of damage that may have a potential impact on the safe functioning of the Dam;¶
(f) Any activity where 10 percent or more of the fill material in the Dam is disturbed; or¶
(g) Any other change to the Dam that results in a deviation from the original design and that affects the safe functioning of the Dam¶
(3) Dam Modification plans shall include all details of the area of the Dam being modified. Specific modification plan requirements include, but are not limited to:¶
(a) For major Spillway repairs, plans need to address passage of the required Inflow Design Flood based on the Hazard Rating of the Dam, with the same criteria as required for new Dams in OAR (690-020 0037);¶
(b) For repairs of slope movement, plans require slope stability analysis and appropriate corrective measures;¶
(c) For replacement of Conduits or installation of a Valve on the downstream side of a Dam, plans require an analysis of internal erosion potential;¶
(d) For internal erosion, plans must address construction of a filter zone; and¶
(e) Items required by the State Engineer pursuant to subsection 4.¶
(4) The Dam owner shall provide sufficient notice to the Department to allow for adequate time for discussion of the proposed Modifications and the necessary design requirements.¶
(5) The State Engineer will determine the design and submittal requirements. Submittal requirements and Department reviews may be expedited in the event of emergency or unanticipated weather-related situations.¶
(6) Water is not to be stored in the reservoir during modification. The Engineer of Record may propose maintaining some Water in storage during Dam Modification or modifying Dam Height if it is demonstrated that it can be done in a manner that protects life, property, and infrastructure. The Department will review submitted materials for the proposed construction actions. The Department may consider the scope of the project, including how the proposed construction actions will maintain safe Water levels through the duration of construction.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.443, 540.449, 540.488

REPEAL: 690-020-0150

RULE SUMMARY: Rules repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0150~~
~~Routine Inspection of Dams~~
~~(1) The Department shall maintain a program of inspecting dams and may conduct routine safety inspections of dams with an inspection frequency based on the hazard rating of the dam and may specify modifications necessary to insure the safety of the works to prevent possible damage to life or property.¶~~
~~(2) The frequency of inspections may be based on the hazard classification of the dam. Inspections may occur as follows:¶~~
~~(a) Inspections for high hazard dams may be scheduled on an annual basis;¶~~
~~(b) Inspections for significant hazard dams may be scheduled every three years; and¶~~
~~(c) Inspections for low hazard dams may be scheduled every six years.¶~~
~~(3) Expedited inspections may be conducted if an urgent dam safety issue is identified or if there is a potential change in hazard classification.¶~~
~~(4) Following an inspection, the Department shall provide to dam owners a letter with the inspection observations and recommendations that assist the dam owner to ensure the safety of the dam.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 540~~

ADOPT: 690-020-0160

RULE SUMMARY: Describes requirements for owner submittals and department reviews of plans to remove certain dams, including necessary documentation, supervision and inspection.

CHANGES TO RULE:

690-020-0160
Removal
(1) Dam owner(s) seeking to remove or partially remove any Dam that has a High or Significant Hazard Rating must notify the Department.¶
(2) Dam owner(s) shall provide the Department with a removal plan for evaluation prior to removing the Dam. Plans must be submitted a minimum of 60 days in advance of removal to allow reasonable time to evaluate the removal plan, unless the Department agrees to a different timeframe.¶
(3) A removal plan must include:¶
(a) Descriptions and assumptions for the removal or partial removal of the Dam;¶
(b) A description of the means for removing the Dam to prevent future impoundment and a method of draining the reservoir in a controlled manner prior to the start of the removal;¶
(c) A schedule listing the major events and corresponding time frame that will occur during the removal;¶
(d) A plan for disposal and stabilization of Dam material; and¶
(e) In the case of a partial removal, a drawing showing the planned removal location, breach dimensions including side slopes, and lowest elevation of the breach. For any partial removal, the removal plan must show that there will sufficient material removed and left at slopes that will allow no breach flood by erosion of remaining materials.¶
(4) The Department may evaluate the removal plan to ensure that the plan includes appropriate safety precautions to protect life, property, and public infrastructure from temporary inundation in the area below the Dam during Dam removal.¶
(5) The Department may require Modification of the removal plan or require that the work performed under the plan be supervised by an Engineer. If the Department requires Modification of the removal plan or requires that work be supervised by an Engineer, the Department shall notify the Dam owner and provide an opportunity to meet with the Department.¶
(6) Upon completion of the Dam removal, the owner shall notify the Department. The Department shall make a final inspection, if appropriate, and remove it from Department Dam safety oversight.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.452, 540.488

ADOPT: 690-020-0180

RULE SUMMARY: Requires Dam owner to provide contact information to the Department.

CHANGES TO RULE:

690-020-0180
Requirement of Owners to Provide Contact and Transfer of Title Information
(1) If an Emergency Action Plan exists, a Dam owner shall provide the Department with contact information in the Emergency Action Plan consistent with OAR 690-020-0400, and notify the Department of any changes in contact information, including transfer of title for the Dam.¶
(2) If no Emergency Action Plan exists, a Dam owner shall:¶
(a) Provide the Department with contact information in writing for the Dam owner, the individual in immediate charge or the Dam, and the operator of the Dam, if other than the owner; and¶
(b) Notify the Department of any changes in contact information, including transfer of title for the Dam.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.479, 540.488

REPEAL: 690-020-0200

RULE SUMMARY: Rules repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0200~~
~~Fees for Dams~~
~~(1) Dam owners subject to dam safety regulations shall submit to the Department an annual fee on the basis established under ORS 536.050(2).¶~~
~~(2) Dam owners who fail to pay an annual fee on or before six months after the billing date may be required to pay a late fee of $100.¶~~
~~(3) If a dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the dam owner notice by certified mail, place a lien on the real property where the dam is located for the fees owed by the dam owner.¶~~
~~(4) Multiple large dams connected together and separated only by embankments or other manmade materials (common with sewage lagoons) will count as one dam for fee purposes.¶~~
~~(5) The Department may use the dam safety fee to support dam safety inspections; conduct dam breach inundation analysis for existing dams; help dam owners complete emergency action plans for existing dams; conduct or support the technical analysis of the safety of specific dams; and other actions as needed to support the dam safety program.~~
~~Statutory/Other Authority: ORS 536.050~~
~~Statutes/Other Implemented: ORS 536.050~~

AMEND: 690-020-0250

RULE SUMMARY: Modification to existing rule to reference authority and to carry forward and identify elements for maintenance of typical dams.

CHANGES TO RULE:

690-020-0250
Maintenance of Dams ¶

(1) ~~W~~The~~n inspecting dams to insure the safety of~~ Dam owner shall review and evaluate conditions of the Dam as necessary to keep the ~~d~~Dam~~, the Department may consider whether the dam owner has conducted routine maintenance on dams as follows:¶~~
~~(a) Whether brush and trees have been removed and whether vegetation on the embankment or spillway has been mowed;¶~~
~~(b) Whether burrowing animals are controlled and animal burrows are filled;¶~~
~~(c) Whether~~ in good repair and properly maintained, and address any detected conditions that may pose a risk of Dam Failure.¶
(2) Proper maintenance includes but is not limited to:¶
(a) Removal of brush and trees from the Dam;¶
(b) Control of burrowing animals, especially nutria near the Dam or reservoir, including filling deep burrows;¶
(c) Restoration of areas of surface ~~erosion is effectively controlled;¶~~
~~(d) Whether freeboard and adequat~~or wave erosion, and taking measures to prevent future erosion;¶
(d) Adding or moving fill to restore ~~c~~Crest ~~width have been maintained;¶~~
~~(e) Whether~~Height and width;¶
(e) Clearance of soil, rock, vegetation and debris from the ~~s~~Spillway ~~is functioning correctly and that its capacity has not been reduced;¶~~
~~(f) Whether mechanical equipment has been properly cycled and lubricated;¶~~
~~(g) Whether cracked concrete structures ha~~;¶
(f) Proper cycling and lubrication of Valves and Gates at least once a year, unless otherwise specified in a maintenance and operations plan approved b~~een properly p~~y the Department;¶
(g) P~~atched~~ing, seal~~ed, caulked or repl~~ing, or replacing areas of cracked ~~to prevent deterioration;¶~~
~~(h) Whether~~concrete on the Dam;¶
(h) Removal of debris, rock, or earth ~~have been removed from outlet conduits, outlet channels or spillway channels;¶~~
~~(i) Whether worn or damaged parts of conduits, outlet valves or controls are in need of repair or replacement;¶~~
~~(j) Any other condition or activity that might affect safety of the dam.~~from the inlet and outlet of penetrating Conduits and drains;¶
(i) Repair or replacement of worn or damaged parts of Gates or Valves;¶
(j) Ensuring access to the Dam is sufficient for inspection, repair and emergency actions, and that unauthorized access is controlled;¶
(~~2~~k) ~~The Department may find that a dam is not safe if large trees or large woody vegetation exists on the dam.¶~~
~~(3) Maintenance deficiencies observed during periodic dam safety inspections shall be described in an inspection letter provided to~~Securing operating equipment such as Valve controls and Spillway controls;¶
(l) Evaluation of the Conduit and taking necessary actions to ensure the Conduit is not compromised, including patching pipes with minor corrosion; and¶
(m) Addressing other conditions that might affect the safety of the Dam.¶
(3) Maintain records as needed to track conditions on the dam ~~owner~~.
Statutory/Other Authority: ORS 5~~40.350 -~~36.027, 540.4~~00~~88
Statutes/Other Implemented: ORS ~~183, 536~~540.479, 540.488, 540.455

ADOPT: 690-020-0260

RULE SUMMARY: Replaces similar rule proposed for repeal. Describes Department's Dam inspection process and includes requirement to provide an inspection document to the Dam owner.

CHANGES TO RULE:

690-020-0260
Inspection of Dams
(1) The Department or representatives of the Department, may inspect a Dam and the site, plans and specifications, features and other supporting information regarding the construction, maintenance and operation of a Dam.¶
(2) The Department will maintain a Dam inspection schedule based on the Hazard Rating of the Dam:¶
(a) High Hazard Dams are scheduled for inspection annually,¶
(b) Significant Hazard Dams are scheduled for inspection every 3 years, and¶
(c) Low Hazard Dams are scheduled for inspection every 6 years.¶
(3) Notwithstanding subsection (2), the Department may determine that a different inspection schedule is appropriate. The Department may consider staff resources and Dam risks or condition in determining that a different inspection schedule is appropriate.¶
(4) The Department shall provide the Dam owner with an inspection document describing the general condition of the Dam and specific maintenance recommended or Maintenance Actions required by the Department.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.479, 540.455, 540.467

REPEAL: 690-020-0300

RULE SUMMARY: Rules repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0300~~
~~Modification of Dams Requiring Notification and/or Approval~~
~~(1) The activities described in OAR 690-020-0080(3) are considered such significant modification of the dam so as to constitute new construction requiring approval of engineered designs prior to initiating these activities.¶~~
~~(2) Any activity that will increase the volume or rate of water released during failure requires a new inundation analysis using methods described in OAR 690-020-0120 unless the dam is in a remote area with no downstream development or high recreational use areas that might be affected by a dam breach flood.¶~~
~~(3) Certain repairs that may affect the safety of the dam require on site analysis by an engineer during the actual repair process in order to determine the specific repairs needed. Prior approval of drawings for these repairs will not be required, as conditions encountered on site are likely to deviate from plans. Therefore, submission of an as-built drawing by the engineer of record of the following repairs indicating the repairs have been made correctly may be deemed as evidence of the safety of the dam:¶~~
~~(a) Slip lining of existing conduits that does not involve excavation into the dam and does not result in a significant reduction in the time required for the conduit to empty the reservoir;¶~~
~~(b) Replacement of toe drains; and¶~~
~~(c) Any other such repairs as determined by the State Engineer.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 540~~

ADOPT: 690-020-0310

RULE SUMMARY: Describes process for identification, communication and evaluation of Dam maintenance actions required by the Department, including possible imposition of civil penalties.

CHANGES TO RULE:

690-020-0310
Maintenance Actions
(1) Upon inspection of a dam, the Department will determine the need for maintenance action to address conditions observed during an inspection and shall provide this information to the Dam owner in the inspection summary for low hazard dams. The Department shall use the process that follows for maintenance action on dams that are rated Significant or High Hazard.¶
(2) Upon inspection of a Dam that is rated as High or Significant Hazard, the Department shall provide specific written notice to the Dam owner describing the observed condition of the Dam and shall inform the Dam owner of necessary maintenance actions needed to correct maintenance deficiencies.¶
(a) The notification shall provide the Dam owner with the opportunity to meet with the Department concerning the information provided in the inspection notification. Upon request of the Dam owner, the Department may provide more specific information regarding the inspection and the maintenance needs of the Dam. In addition, the Department and the Dam owner may enter into a Stipulated Correction Plan that provides dates certain by which necessary maintenance actions are performed.¶
(b) The Department may evaluate whether maintenance was successfully completed during the next scheduled inspection of the Dam or the Department may expedite the Dam inspection schedule for the next inspection to determine whether recommended conditions have been completed.¶
(c) If upon inspection of the Dam the Department determines that the Dam owner has failed to take the necessary maintenance actions as identified in the inspection notification or a Stipulated Correction Plan, the Department may proceed to issue a proposed final order as provided in OAR 690-020-0460. A proposed final order may include provisions including, but not limited to provisions:¶
(A) Requiring performance of the necessary maintenance requirements identified in the inspection notification by a date certain as specified by the Department;¶
(B) An assessment of civil penalties consistent with OAR 690-020-0600.¶
(d) At any time subsequent to receipt of a proposed final order, the Dam owner may enter into a Stipulated Corrective Plan to resolve the matters asserted in the proposed final order as provided in ORS 183.417. If the Dam owner performs needed maintenance actions to the satisfaction of the Department and consistent with the Stipulated Corrective Plan, the Director may not assess or pursue civil penalties for the matters identified in the Stipulated Corrective Plan.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.467

ADOPT: 690-020-0340

RULE SUMMARY: Specifies process for determination of potentially unsafe and unsafe conditions at a Dam. Requires specific process for Department to issue proposed and final orders if the cooperative plan is not followed, or the Dam becomes unsafe.

CHANGES TO RULE:

690-020-0340
Potentially Unsafe or Unsafe Conditions
(1) The Department shall determine whether a High or Significant rated Dam is potentially unsafe or unsafe after inspection or analysis of the Dam. Potentially unsafe or unsafe conditions must be addressed by any lawful remedy available to the Department including issuance of a proposed final order as specified in this rule.¶
(2) Potentially Unsafe conditions include, but are not limited to:¶
(a) Embankment materials highly vulnerable to internal erosion;¶
(b) Highly variable and increasing rates of seepage;¶
(c) Seismic analysis determines significant Crest loss with little Freeboard remaining;¶
(d) For Dams in high seismic zones, a layer of liquefiable material in the Dam or its Foundation;¶
(e) Evidence of prior large rapidly moving landslides identified above the Dam;¶
(f) Spillways are unable to pass the Inflow Design Flood as stated in 690-20-0037 or Probable Maximum Flood; or¶
(g) Issues on the Spillway invert that could lead to rapid loss of Spillway integrity.¶
(3) Unsafe conditions include, but are not limited to:¶
(a) Any reduction in Spillway capacity;¶
(b) Movement of the Dam over a short period of time;¶
(c) Major loss of Freeboard;¶
(d) Wave erosion narrowing Dam Crest;¶
(e)Internal erosion with limited movement of Embankment material;¶
(f) Seepage level rising on the downstream face of the Dam;¶
(g) Landslide or other deformation on the Dam;¶
(h) Rapid erosion of the Spillway;¶
(i) Significant loss of mass of a concrete Dam;¶
(j) Concrete Spillway with large voids or openings through the slab;¶
(k) Conduit deteriorated to where Conduit collapse is reasonably possible;¶
(l) A Pressurized Conduit with holes in the pipe;¶
(m) Flashboards in place during high runoff season;¶
(n) Animal burrows penetrating deep into the Dam;¶
(o) Large trees growing near the Crest of the Dam; or¶
(p) Any new Dam construction or construction of a Dam to increase Height in violation of requirements for examination and written approval of site plans, specification, and other supporting information for that Dam.¶
(4) Notification of Potentially Unsafe or Unsafe Conditions. If as a result of an inspection or analysis of a Dam that has a High or Significant Hazard rating the Department concludes that corrective action is necessary to address a condition rendering the Dam Unsafe or Potentially Unsafe, the Department shall provide written notification to the Dam owner by registered or certified mail, return receipt requested, sent to the address of record on file with the Department, as per OAR 690-020-0180, for the Dam owner.¶
(a) The written notification shall include at least the following:¶
(i) An explanation of why the inspection or analysis of information and conditions causes the Department to conclude that the Dam is unsafe or potentially unsafe;¶
(ii) Any action the Department concludes is necessary to address the unsafe or potentially unsafe conditions;¶
(iii) Notification to the Dam owner of the opportunity to meet with the Department to discuss the notification; and¶

(iv) Notification to the Dam owner of the opportunity to explain why the Dam owner disagrees with the matters asserted in the notification.¶
(b) Following issuance of a notification, the Department may endeavor to resolve the unsafe or potentially unsafe conditions identified in cooperation with the Dam owner. The Department and owner may enter into a consent order to address the corrective action, but only as such cooperation and agreement results in timely resolution of the unsafe or potentially unsafe conditions. In developing a consent order, the Department may consider any relevant information, including but not limited to:¶
(i) The design and construction of the specific Dam;¶
(ii) The efforts and resources of the Dam owner; and¶
(iii) The impacts associated with Dam failure.¶
(5) The Department may issue a Proposed Final Order in the event the Department and the Dam owner do not enter into a Stipulated Corrective Action agreement to address corrective actions, if the Dam owner fails to complete necessary actions as provided in the consent order, or in the event the Dam owner does not otherwise address the matters identified in the notification to the Departments satisfaction.¶
(a) The proposed final order shall include the specific information and conditions that have caused the Department to conclude that a Dam is unsafe or potentially unsafe, shall be consistent with ORS 183.415, and shall provide notice of the opportunity for a contested case hearing pursuant to ORS 183.¶
(b) The proposed final order may include, but need not be limited to any or all of the following provisions:¶
(i) Notifying the Dam owner what information and conditions caused the Department to determine that the Dam is unsafe or potentially unsafe and the actions the Department concludes are necessary to address the unsafe or potentially unsafe conditions.¶
(ii) A requirement that the Dam owner consult with an engineer to assess the nature and extent of the unsafe or potentially unsafe conditions identified by the Department and to identify corrective actions to address the unsafe or potentially unsafe conditions.¶
(iii) Commencement and completion dates for any corrective action the Department determines is necessary to remedy the unsafe or potentially unsafe conditions.¶
(iv) Restrictions on the maximum Water level in the reservoir until corrective action has been completed to the satisfaction of the Department.¶
(v) Provisions directing that the Dam may not be used for the impoundment, restraint or conveyance of Water until corrective actions have been completed to the satisfaction of the Department.¶
(vi) Requirement to install and maintain monitoring equipment if the Department concludes that monitoring is necessary to protect life, property or public infrastructure. The provisions requiring the installation and use of monitoring equipment at a Dam to monitor the unsafe or potentially unsafe conditions shall include the ability to the use the most economical monitoring equipment which is sufficient to protect life, property and public infrastructure as determined by the Department.¶
(6) Upon issuance of a proposed final order, the Dam owner and Department may enter into a Consent order to resolve the matters in the proposed final order as provided in ORS 183.417. Any such document must include conditions to address the matters in the proposed final order as determined by the Department.¶
(7) If following issuance of a proposed final order the Department receives a request for hearing from the Dam owner, the Director may request that the scheduling of any contested case hearing be expedited, and the Office of Administrative hearings shall expedite the contested case hearing to the extent that the office considers it practicable and will give the Dam owner reasonable time to prepare.¶
(a) In determining the expedited timeline practicable, the Office of Administrative Hearings shall consider, based on information provided by the Department, any conditions that may affect the urgency of the proceedings or the likelihood that unsafe or potentially unsafe conditions may pose near-term threat to life, property or public infrastructure.¶
(b) The reasonable time to prepare for a contested case hearing shall be based on the likelihood that unsafe or potentially unsafe conditions may pose a near-term risk to life, property, or public infrastructure.¶
(8) Issuance of a proposed final order does not preclude the Department from pursuing any and all lawful

remedies as the Department may determine are necessary to protect life, property or public infrastructure including but not limited seeking injunctive relief in the circuit court.¶

(9) In addition to any other available lawful remedies, if a proposed final order issued under this section becomes final by operation of law or on appeal, and the Dam owner fails to comply with the order as specified in the order, the Department may request the Attorney General or the district attorney of any county where all or part of the Dam is located to bring an action declaring the Dam a public nuisance and ordering its removal at the owner's expense.

Statutory/Other Authority: ORS 536.027, 540.488

Statutes/Other Implemented: ORS 540.458, 540.461

REPEAL: 690-020-0350

RULE SUMMARY: Rule repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0350~~
~~Operations and Maintenance Plans~~
~~(1) As part of the plans submitted with the design, the engineer of record shall provide to the Department operations and maintenance plans for new significant and high hazard dams, and for any new dam with a gate or flashboard as part of the spillway. The dam owner shall be responsible for implementation of operations and maintenance plans, and compliance with these may be reviewed during dam safety inspections.¶~~
~~(2) Operations and maintenance plans may include but are not limited to:¶~~
~~(a) Procedures for operation of all gates and valves;¶~~
~~(b) Specified frequency for cycling of the slide gate and/or valves;¶~~
~~(c) The time of year flashboards are allowed in the spillway;¶~~
~~(d) Removal of trees and shrubs, and mowing other vegetation as needed;¶~~
~~(e) Routine inspections, including evaluation of seepage flow, and visual identification of any turbid seepage;¶~~
~~(f) Water release plan in the event of a flood forecast when reservoir is above a certain level; and¶~~
~~(g) Measurement frequency for all monitoring instrumentation installed at the dam.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 540~~

AMEND: 690-020-0400

RULE SUMMARY: Provides information for planning and response to incidents at Dam rated as High Hazard. Provides criteria for elements included in Emergency Action Plans for updates and exercises of plans.

CHANGES TO RULE:

690-020-0400
Emergency Action Plans (EAP) and Emergencies ¶

(1) Draft Emergency Action Plans are required prior to completion of new dam construction or modification as described in OAR 690-020-0300(1), andAll High Hazard Dams shall have an Emergency Action Plan (EAP). The EAP is to assist the Dam owner and local emergency management personnel to ensure human safety in the event of a potential or actual Dam Failure. The final EAP, for new Dams or where Dam height is modified, must be reviewed and approved by the State Engineer.¶
(2) A Draft EAP is required prior to completion of new Dam construction.¶
(3) A final EAP's must be submitted prior to filling thea new reservoir. The final emergency action planEAP must be reviewed and approved by the State Engineer. EAPs for dams constructed after March 2015 must be updated at least once every two years, including but not limited to ensuring all notificatio¶
(4) Owners of Dams which have been reclassified to a High Hazard Rating will be required to develop and submit an EAP within contacts are current.¶
(2) Dam owners are encouraged to complete emergency action plans for their existing high hazard damse year of being notified of the reclassification by the Department.¶
(35) An EAP shall contain, as a minimum, the following key elements:¶
(a) EMeans for emergency condition detection;¶
(b) EMeans for emergency level determination;¶
(c) NIdentification of, and information necessary for, notification and communication lists applicable to each of the to be made at each level of emergency levels;¶
(d) Expectedcondition;¶
(d) Description of actions to prevent a dDam fFailure incident or to help reduce the effects of a dDam fFailure and facilitate response to an emergency;¶
(e) Inundation mapping that normally includes both a sunny day and a probable maximum flood failureA map of Dam Failure inundation zones developed using a Dam breach inundation analysis for varying conditions as specified by the Department, including, but not limited to, dry weather conditions and high flood conditions. The Department may require one inundation map if the dry weather and high flood flows are not substantially different. The inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section; and¶
(f) Procedures for termination of the emergency.¶
(4)6) The Dam owners of high or significant hazard dams shall immediately notify the State Engineer of potential or actual dam failure situations.¶
(5) Dam owners shall notify the State Engineer of an shall file copies of the EAP with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located.¶
(7) The Department will, in consultation with the local Office of Emergency Management:¶
(a) Periodically breach of any dam subject to these regulations.view the EAP and may require updates to the plan that recognize the actual capabilities of the local emergency managers, and¶
(6b) If the Department observes evidence of a dam at risk of imminent failure and a risk to life or property, local public safety officials shall be notDetermine the appropriate frequency for conducting emergency response exercises.¶
(8) In the event of an actual or potential Dam Failure which creates an imminent risk to life, the Dam owner shall immediately implement the actions specified ofin the situationEAP.
Statutory/Other Authority: ORS 540.350 - 36.027, 540.4008

Statutes/Other Implemented: ORS ~~183, 536~~540.482, 540.485

ADOPT: 690-020-0410

RULE SUMMARY: Describes actions for Dam owner to take for Dam rated High or Significant Hazard without an Emergency Action Plan.

CHANGES TO RULE:

690-020-0410
Emergency Actions for Significant Hazard Dams
If an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure, and no EAP exists for the Dam, the Dam owner shall immediately:¶
(1) Notify the local emergency services agency, the Department, and Persons in areas where the potential for Dam Failure creates risk to life, property, or public infrastructure by telephone or other methods that ensure immediate notification, and¶
(2) Take all practicable actions to prevent Dam Failure.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.482, 540.485

ADOPT: 690-020-0420

RULE SUMMARY: Describes Water Resources Department actions in an emergency at a Dam rated High or Significant Hazard.

CHANGES TO RULE:

690-020-0420
Immediate Action to Prevent Dam Failure
(1) If an actual or potential failure creates an imminent risk to life, property or public infrastructure and an Emergency Action Plan exists for that Dam, a Dam owner must immediately implement the actions specific in that plan.¶
(2) If no emergency plan exists, and an actual or potential failure creates an imminent risk to life, property or public infrastructure, the Dam owner shall immediately notify by telephone or other method that ensures immediate notification:¶
(a) For Dams rated High or Significant Hazard, the local emergency services agency for the county where the Dam is located;¶
(b) The Department; and¶
(c) To the extent practicable, persons in the areas where the potential for Dam failure creates a risk to life, property or public infrastructure.¶
(3) In addition to providing notification as described in this rule, a Dam owner must also take any and all practicable measures to prevent Dam failure.¶
(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, it may take any immediate action to prevent failure of the Dam. The Department may:¶
(a) Immediately contact and advise the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure;¶
(b) If a Dam has a Significant or High Hazard rating, the Department or its agents or representatives may enter the property without notice or permission of the pertinent landowner to access the Dam and evaluate the condition or risk or to undertake necessary actions.The Department's entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary.¶
(c) If the Department observes that there is a rapidly increasing leakage risk of overtopping at a Dam that has a Significant or High Hazard rating, the Department may perform any or all of the following actions:¶
(A) Open Gates or Valves and siphon or pump Water to reduce the Water levels in the reservoir;¶
(B) Modify approval requirements for emergency construction work;¶
(C) Allow Modification of the actions prescribed in an Emergency Action Plan; and,¶
(D) Pursue any other lawful remedy.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.482, 540.485

ADOPT: 690-020-0460

RULE SUMMARY: Implements provisions to notify Dam owners of potential non-compliance with rules. Provides procedures for issuance of proposed final orders, hearings, and final orders.

CHANGES TO RULE:

690-020-0460
Proposed Final Order, Request for Hearing, Contested Case Process
(1) Proposed Final Order, Notice of Assessment of Civil Penalty. A proposed final order or a Notice of Assessment of Civil Penalty must be consistent with the provisions of ORS 183.415, shall include notification of the right to a contested case hearing pursuant to ORS 183, and shall include any applicable or required element otherwise specified in Dam safety rules governing proposed final orders. A proposed final order or a Notice of Assessment of Civil Penalty must be served personally or by registered or certified mail.¶
(2) Request for Hearing. A Dam owner that receives a proposed final order or a Notice of Assessment of Civil Penalty has 20 calendar days from the date of service of the proposed final order in which to file a written request for hearing. The request for hearing must be filed either in person or by mail addressed to the Department's office in Salem, Oregon. The request for hearing may not be considered timely filed unless it is received in the Department consistent with this subsection. The request for hearing must include a written response that admits or denies all factual matters alleged in the notice, and must state with specificity the reasons for disagreement with the proposed final order.¶
(3) Contested Case Procedure. Contested case hearings resolving requests for hearing to proposed final orders issued by the Department under these rules shall be heard by administrative law judges from the Office of Administrative Hearings. Hearings shall be conducted as provided in ORS 183 and the Attorney General's Uniform and Model Rules of Procedure under the Administrative Procedures Act in OAR 137-003-501 - 0700 except:¶
(a) Only a Dam owner or the Dam owner's authorized representative may request a contested case hearing and be considered a party in any contested case.¶
(b) For expedited contested case hearings regarding proposed final orders addressing unsafe or potentially unsafe conditions, discovery methods as provided in OAR 137-003-0566 shall not be allowed because the availability of other forms of discovery would unduly delay proceedings to address conditions that address a near-term risk of threat to life, property or public infrastructure. Notwithstanding, a party may request public documents pursuant to a request for public records made to the Department as described in OAR Chapter 690 Division 3.¶
(c) Immediate review under OAR 137-003-0640 is to the Director only.¶
(4) Proposed Order in Contested Case. Following the close of the record for a contested case hearing, the administrative law judge will issue a proposed order and shall serve the proposed order on each participant to the contested case.¶
(5) Exception to Proposed Order. If the recommended action in the proposed order is adverse to any party the party may file written exceptions to the Department within 15 days after a proposed order is served.¶
(6) Final Order. The Director may consider any exceptions received and shall issue a Final Order as provided in OAR 137-003-0665. An order adverse to a party may be issued upon default as provided in OAR 137-003-0672.¶
(7) The Department and a Dam owner may at any time use informal or alternative means to resolve a contested case hearing. When informal disposition of a contested case is made by stipulation, agreed settlement or consent order, the final order that incorporates the informal disposition is not subject to judicial review.
Statutory/Other Authority: ORS 536.027, 540.488, 183
Statutes/Other Implemented: ORS 183, 540.461, 540.467, 540.488, 540.995, 540.458

REPEAL: 690-020-0500

RULE SUMMARY: Rule repealed to conform with changes to statute made in 2019, updates made to other sections of rules, and for clarity.

CHANGES TO RULE:

~~690-020-0500~~
~~Enforcement~~
~~(1) When any dam is found to be in violation of the terms and conditions of the water right permit or certificate, or directly threatens life or property, or when any structure is found where lack of maintenance or unauthorized alterations could lead to a direct threat to life or property, the Department shall notify the owner in writing of the violation and the action necessary and specified time allowed to bring the structure up to design, operation, or maintenance standards.¶~~
~~(2) Failure by the owner to perform the required action may result in proceedings for one or more of the following:¶~~
~~(a) Notice and opportunity for a contested case hearing as provided for in ORS 540.350(5).¶~~
~~(b) Posting of the structure to prevent storage or to limit operation until the owner has complied with the requested action required to fulfill conditions of the permit or certificate.¶~~
~~(c) Instituting legal action by the District Attorney or Attorney General to have the facility declared a public nuisance.¶~~
~~(d) Issuance of an order to prevent storage or to breach the embankment as provided for in ORS 540.370.¶~~
~~(e) Any other enforcement action permitted by law.¶~~
~~(3) Engineering work that is inconsistent with any rules in this Division may be referred to the Oregon State Board of Examiners for Engineering and Land Surveying, for appropriate actions.~~
~~Statutory/Other Authority: ORS 540.350 - 540.400~~
~~Statutes/Other Implemented: ORS 183, 536, 540~~

ADOPT: 690-020-0600

RULE SUMMARY: This rule provides criteria for issuance of civil penalties as authorized by Statute. Civil penalties may be issued for: failing to submit design and operation documents prior to Dam construction; impounding Water prior to final Dam documentation; not providing removal plans for Department review; not completing, updating or exercising an Emergency Action Plan; and not correcting a maintenance deficiency on a Dam. This rule provides a schedule of penalties, occurrence periods; and penalty remittance criteria.

CHANGES TO RULE:

690-020-0600
Civil Penalty Assessment for Dam Safety
(1) The Department may assess civil penalties for the following violations:¶
(a) Construction of a Dam without prior written approval from the Department of the final Dam design, construction documents and operation documents as described in 690-020-0080(1) and 0140 (1);¶
(b) Impoundment of Water behind a Dam before final documentation has been submitted and accepted by the Department as provided in in 690-020-0080 (4) and 0150(6);¶
(c) Beginning construction to remove a High or Significant Hazard Rated Dam rated as High or Significant Hazard prior to providing notice to the Department, as provided in 690-020-0160;¶
(d) Failure to file an Emergency Action Plan with the Department, Office of Emergency Management, and the local emergency services agency for the county where the Dam is located, as provided in 690-020-0400;¶
(e) Failure to complete needed Dam Maintenance Actions on a High or Significant Hazard Dam, as identified in a prior inspection document sent from the Department to the Dam owner, as described in 690-020-0310.¶
(2) The civil penalty for beginning construction of a Dam prior to obtaining written approval from the Department of final Dam design, construction, and operation documents prior to Dam construction activity shall be $2000 for a High Hazard Rated Dam, $1,000 for a Significant Hazard Rated Dam; and $500 for a Low Hazard Rated Dam.¶
(3) The civil penalty for impounding Water prior to submission and acceptance by the Department of the final plans and specifications shall be $1000 for a High Hazard Rated Dam, $500 for a Significant Hazard Rated Dam; and $250 for a Low Hazard Rated Dam.¶
(a) A civil penalty may be assessed for each day of violation for the period the reservoir is impounding Water until satisfactory completion documents are accepted, or until the reservoir is emptied, whichever is sooner.¶
(b) The Department may remit all or a portion of a civil penalty if completion documents existed but were not submitted, and those documents meet the criteria, or for Dams which are modified to be exempt from Dam safety requirements as per ORS 540.446 (1)).¶
(4) The civil penalty for beginning construction work to remove a Dam rated as High or Significant Hazard prior to submission and acceptance of a Dam removal plan, failure to modify the plan if required, or failure to follow the modified plan shall be $2000 for a High Hazard Rated Dam and $1000 for a Significant Hazard Rated Dam¶
(a) A civil penalty may be imposed for each day of violation beginning on the day removal activities began until the Dam is no longer storing Water and construction work to remove the Dam has ceased.¶
(b) The Department may remit all or a portion of this civil penalty if the Department receives and accepts a Dam removal plan and determines that Dam removal was consistent with the plan and completed safely with no downstream damage.¶
(5) The civil penalty for failure to file an Emergency Action Plan for a High Hazard Rated Dam with the Department, Office of Emergency Management, and the local emergency services agency for the county where the Dam is located shall be $2000.¶
(a) A civil penalty may be imposed for each month of violation beginning on the date the notice of violation was first provided to the responsible party.¶
(b) The Department may remit all or a portion of the civil penalty if development of the plan is underway and the plan is submitted within 60 days of the due date.¶
(6) The civil penalty for failure to complete needed Maintenance Actions identified in a prior inspection document for Dams rated as High or Significant Hazard shall be:¶

(a) A civil penalty of $500 may be assessed for failure to perform required Maintenance Action(s) on a High Hazard Rated Dam which could result in the Dam becoming Unsafe. Each month will constitute a new violation until the required Maintenance Action(s) are completed;¶
(b) A civil penalty of $250 may be assessed for all other required Maintenance Actions. Each month will be considered a new violation until the required Maintenance Action(s) are completed;¶
(c) A civil penalty of $250 may be assessed for failure to perform required maintenance on a Significant Hazard Rated Dam which could result in the Dam becoming Unsafe. Each month the violation continues will be considered a new violation;¶
(d) A civil penalty of $150 may be assessed for failure to complete all other required maintenance for a Significant Hazard Rated Dam. Each month that the required Maintenance Action(s) is not completed will be considered a new violation; and,¶
(e) The Department may remit all or a portion of a Civil Penalty if the Dam owner voluntarily complies with a schedule for repairs that allows necessary engineering or inspection expertise to address the maintenance issue, or allows for work during more favorable and safe weather conditions.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.467, 540.482, 540.488, 540.449, 540.452

April 6, 2020

Racquel Rancier
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Submitted Via Email: racquel.r.rancier@oregon.gov

Re: Comments on OWRD's Proposed Rulemaking Regarding Safety of Dams: Rules for Design, Construction, Maintenance, Corrective Action, Removal, and Emergencies

Dear Ms. Rancier,

Thank you for the opportunity to comment on the Oregon Water Resources Department's proposed rulemaking regarding dam safety. As you are aware, the Oregon Farm Bureau and Oregon Water Resources Congress both participated in the 2019 legislative negotiations that resulted in HB 2085, and both actively engaged in the Rules Advisory Committee (RAC) charged with the development of the rules in multiple sections of OAR Chapter 690, Division 020 to implement the new legislation. Our members are irrigation districts, farmers and ranchers, and other agricultural entities who own, operate, and/or receive water from dams that are subject to the state's dam safety program, and our members will be directly impacted by the adoption of these rules.

The 2019 legislation and associated rules are quite comprehensive, as these are the first significant updates to the statute in nearly 100 years. We appreciate and understand the need for these updates, as the existing dam safety program was insufficient to address the growing needs of the program around seismic resilience and needed to be modernized to adapt to the needs of the 21st Century. As such, we appreciate the work the Department did to ensure that the concerns of the dam operators were addressed throughout the legislation and associated rule updates while ensuring that the program meets the implementation needs and goals of the Department. Additionally, Department staff did an excellent job ensuring the RAC had adequate information and time to review the proposed rules while also maintaining the schedule for rules adoption and implementation of the program.

However, these updates are comprehensive in nature and represent some significant changes to the program that were only fully understood in the rulemaking process by the Department clearly stating their interpretation and intended implementation approach. It is imperative that the Department adheres to its representations on implementation described during the RAC process. In the first years of the new program, this will mean placing a premium on education rather than enforcement and ensuring flexibility on implementation as unforeseen circumstances arise. Successful implementation of the modernized dam safety program will require proactive outreach and education of impacted dam owners and operators to ensure awareness and understanding of the new rules.

We also encourage the Department to provide periodic updates on the implementation of these changes, at a minimum providing annual reports to the Water Resources Commission in the first years of the program, and to create opportunities for dam operators to provide formal feedback. This is particularly important in the first years of the program, as implementation of the modernized dam safety program needs to remain workable and grounded in reality. Such reports will allow for early adjustments to any unforeseen circumstances and ensure that the Department has the tools to efficiently oversee the state's Dam Safety program.

Passage of HB 2085 and development of the accompanying set of updated rules was a herculean effort undertaken by the Department and its stakeholders, and a necessary but long overdue effort to modernize a 100-year-old program to meet current needs. We strongly encourage the Department not to wait another 100 years to address ongoing needs within the program. Instead, the Department needs to review its rules and processes regularly to ensure they not only meet the program's goals, but do not impose an undue hardship on dam operators and remain readily implementable.

Thank you for the opportunity to provide comments, and please let us know if you have any questions.

Sincerely,

April Snell
Oregon Water Resources Congress

Mary Anne Cooper
Oregon Farm Bureau

April 6, 2020

Oregon Water Resources Department
800 Summer Street NE
Salem, OR 97310

Re: Notice of Proposed Rulemaking

The American Council of Engineering Companies of Oregon (ACEC Oregon) would like to take this opportunity to voice our concern regarding a portion of the proposed rulemaking below highlighted in yellow. Briefly, our concerns center around the change in the proposed dam safety rules, that will place responsibility for dam construction on the Engineer of Record. This language adds a major new responsibility to our profession that is currently not a customary function of our services. We will continue to work with the Department to find a resolution to this significant matter.

AMEND: 690-020-0065
RULE SUMMARY: This is an existing rule with no substantive changes. Describes minimum information in engineer's plan for Dam construction to allow Department review and approval.

CHANGES TO RULE:
690-020-0065

(4c) A provision stating that the Engineer of Record is responsible for the construction of the Dam consistent with the approved design and construction documents. This provision should describe periodic inspections to evaluate whether the construction is proceeding in accordance with the approved plans and specifications and describe how the Engineer of Record will take actions to prevent defects and deficiencies in the construction of the Dam and require work identified that fails to conform to the specifications to be corrected.

Thank you,

Alison Davis
Executive Director
American Council of Engineering Companies of Oregon

WALDENSEE, LLC
4308 Orchard Heights Rd. N.W.
Salem, Oregon 97304

April 6, 2020

via first class mail and e-mail
Racquel Rancier
Senior Policy Coordinator
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem OR 97301

Re: Comments on OWRD Notice of Proposed Rulemaking including Statement of Need and Fiscal Impact filed February 27, 2020

Dear Racquel:

Enclosed please find:

Waldensee LLC Comments dated April 6, 2020, regarding the Proposed statement filed February 27, 2020, of the "Need for the Rule(s), Fiscal and Economic Impact and

Waldensee LLC Comments dated April 6, 2020, regarding Safety of Dam Rules filed February 27, 2020.

Please let me know if you have any questions.

Very truly yours,

by Genice Rabe

for Waldensee LLC

Waldensee LLC Comments dated April 6, 2020,
regarding Safety of Dam Rules filed February 27, 2020

The Proposed Rules do not include concerning ORS 540.488 (3)(c).

ORS 540.488(3)(c) provides:

> (3) In addition to any other powers of the department [Oregon Water Resources Department], in carrying out department duties, functions and powers under ORS 540.443 to 540.491, the department may:
>
> (c) Coordinate with federal, tribal, state, local and private entities to enhance the safety of dams or the protection of life, property or public infrastructure in areas below dams.

ORS 540.488 (1) provides that the Oregon Water Resources Department (the Department) may adopt Rules for the administration of ORS 540.443 to 540.491. Thus, the Department has powers to work with public and private entities to protect life, property and public infrastructure in areas below dams. Yet the Department has not included any Rules addressing the responsibility of the Department and other public entities to do so. It should do so.

The Department's work with other governmental and private entities is important to protecting life, property and public infrastructure. And here the Legislature has said that the Department can do so.[1] For example, when a local entity's actions place lives and property in harms' way, however remote, by allowing construction of a house in the outflow stream and area of inundation one-quarter mile from a high hazard dam, the Department as well as the local government should cooperate and work to not have this occur.[2] It is government's responsibility at all levels to protect citizens.

The responsibility of public safety does not lay solely with dam owners particularly when the dam owner takes measures to maintain a dam in good condition and even to prevent potential harm. It also lies with public entities such as the Department. The Department's responsibility does not apply only to regulating dams. It also extends to protecting life by not allowing situations and taking all measures possible to avoid harm including simply not allowing a situation such as building houses in an inundation zone below a dam that could, however remotely, cause loss of life. The Department should embrace this opportunity and take responsibility to protect citizens. This provision of ORS 540.488(3)(c) specifically provides this opportunity. The Department and the Rules should provide that the Department will take action to protect citizens in these Rules.

The Department has repeatedly declined requests for the inclusion of Rules to address ORS 540.488(3)(c). It has stated that it is not financially able. The Department requires dam owners to expend much money on costs as required by these Rules. It also performs inspections, writes reports, pursued this legislation, issues various orders to dam owners, and seeks to enforce them

[1] Above and beyond this statutory permission, protecting citizens and property is a basic tenet and underpinning of all government.
[2] This has happened.

those orders and assign civil penalties and collect them. [3] The stated purpose of the heavy and much increased requirements on owner is safety. But the Department refuses to take action and provide Rules for such action that it can take for safety of citizens and to prevent unsafe conditions for citizens even when the Statute provides such. Money spent by the Department on prevention is much more effective than requiring dam owners to bear increased financial burden, including when unsafe conditions are created by public and private entities. The first duty of all public government and entities is to protect its citizens from harm. The Department should be required to do so.

The proposed Rules misstate the Statute's requirements, exceed the scope of the Statute, and do not include all of the Statute's requirements.

The Department's proposed HB 2085 (ultimately ORS 540.443 to 540.491 and ORS 540.995) was hotly contested and debated in Winter and Spring 2019. It was amended. The amendments addressed the original bill's language to require much more Deapartment cooperation with dam owners. It was also changed to amend definitions and to clearly state procedures. There were other amendments.

Many of the proposed Rules have no basis in the Statute and are contradictory to HB 2085 as passed by the Legislature and signed by the Governor (ORS 540.443 to 540.491 and ORS 540.995). The Statute is very detailed, partially a result of the amendment process, but the Rules do not accurately and completely reflect that detail. The Rules extend to areas not addressed by the Statute.

The Legislature has authority to legislate. The Department does not. The Department and the Rules cannot address matters not in the Statute nor add requirements not within the scope of the Statute. The Department is an administrative and enforcement agency. It also has the responsibility of all public entities to protect life.[4] The Rules filed on February 27, 2020, extend the Rules beyond the provisions amended during the 2019 Legislative session and passed by the Legislature. By misstating the requirements of ORS 540.443 to 540.491 and ORS 540.995, misstating definitions in the Statute, failing to include Rules with regard to all aspects of the Statute, the Department usurps the authority of the Legislature and Governor. It is seeking to legislate through rule making. Its authority is limited to the Statute.

HB 2085 is very specific as to many procedures, a product of the amendment process. The Rules misstate many of the procedures and definitions, do not include provisions, and expand enforcement and civil fines specifically delineated in the S
tatute. For this reason the proposed Rules frequently mislead the dam owner and public, not guide them. They would be better informed by the Statute, not the proposed Rules. Another suggestion is to simply put the detailed procedures, the definitions, civil fines in the Rules, not reword and expand the procedures and fines nor make omissions to them.

[3] Please see section of these comments related to costs and fines, pp. 3-5.
[4] See discussion of Section 17(3)(c), above, pp. 1-2..

The Costs and Civil Penalties imposed by the proposed Rules are Draconian and not required by the Statute. The Rules should be amended to reflect the Statutory Requirements only.

The Department has requested comments on "whether other options should be considered for achieving the rules' substantive goals while reducing the economic impact of the rules on business."

The costs of building and maintaining a dam under the proposed Rules are Draconian and unaffordable.

These Rules include increased costs in fees to the Department and increased expenses for construction; new fees and expenses for removal; and costs related to Emergency Action Plans. The proposed Rules also impose on the dam owner extensive costs for engineers. And the cost of compliance with the Rules in terms of costs for reporting, record keeping, administrative costs, attorneys, equipment, supplies, and labor to maintain the dam for such issues as gopher control, rooty weed control and removal, repairs, installation of gauge, mowing and other grass removal, cleaning spillways, and numerous other activities is huge. Dam owners may simply decide to sell their property or drain their dam. Prospective dam owners will not be able to build needed dams.

In addition the newly imposed civil fines can cost hundreds of thousands of dollars to dam owners. These dam owners may have legitimate reasons for not immediately complying with Department requirements, but they are left with an ineffective procedure for questioning the orders or the fines. In effect they are left with a choice of immediately complying or facing huge fines and worse. The time to appeal with supporting document to a proposed final order is twenty (20) days and less if Department claims so. Twenty (20) days is not sufficient time to gather supporting documents, make a written response, and find a needed lawyer. This time limit itself robs dam owners of due process.

The amount of the civil penalties in the Rules is not supported by the Statute and is astronomical. The Proposed Rule is 690-020-0600. The Civil Penalty Statute is ORS 540.955

The proposed Rules impose fines based on the category in which the dam falls: High Hazard, Significant Hazard, or Low Hazard. The hazard rating has nothing to do with the condition of a dam. It regards the harm that could occur below the dam should it totally fail. The second paragraph of the February 27, 2020, "Need for Rule(s) and Fiscal and Economic Impact" in the "Need for Rule(s)" section, ends with "[a] dam can be in good condition and still be assigned a high-hazard rating." Neither the hazard rating nor the draconian civil penalties tempered by the fact stated by the State Engineer for Water Resources Keith Mills on October 21, 2019, to the Rules Advisory Committee that a "well maintained high hazard dam presents only a remote risk."

As proposed by the Rules, the civil penalties for:

Beginning construction before approval by the Department of construction and operation documents is $2,000 for High Hazard, $1,000 for Significant Hazard, and $500 for Low Hazard dams.

Impounding water before prior plan submission and final plan acceptance by the Department is $1,000 for High Hazard, $500 for Significant Hazard, and $250 for Low Hazard dams. The Rules propose that these fines are **per day.** Thus the fines amount to about $30,000 per month and $365,000 per year for dams with high hazard rating, about $15,000 per month and $185,250 per years for dams with significant hazard rating. The fines for low hazard rated dams are about $7,500 per month, and $91,250 per year.

Beginning construction work to remove a dam prior to submission and acceptance of the plans by the WRD is $2,000 for High Hazard, $1,000 for Significant Hazard, and $500 for Low Hazard dams. The Rules propose that these fines are **per day.** Thus this fines amounts to about $60,000 per month and $730,000 per year for dams with high hazard rating, about $30,000 per month and $365,000 per years for dams with significant hazard rating.

The penalty if a High Hazard Dam owner does not submit an Emergency Action Plan is $2,000 **per month.** This amounts to $24,000 per year.

Civil penalties for not completing maintenance actions identified by theDepartment are $250 or $500 (depending on the action0 **per month** for High Hazard Dams and $150 or $250 (depending on the action) **per month** for Significant Hazard Dams.

The WRD interpretation of these penalties up to $730,000 per year is unfounded in the Statute and Draconian. No where in ORS 540.995(1) pertaining to construction, impoundment, removal, emergency action plans is any per month or per day civil penalty stated. ORS 540.995(1) provides that the Water Resources Director may impose a civil penalty of not more than $2,000 per occurrence for violation of ORS 540.449 (Construction Plan Approval), ORS 540.452 (Removal Plan approval), and ORS 540.482 (Emergency Action Plan for High Hazard rated dams). ORS540.995 (2) in the only part of the Statute that addresses continuing violations. ORS 540.995 (2) provides the director may impose a civil penalty, not to exceed $500 under ORS 540.467 regarding maintenance actions. The Statute explains that if the violation is continuing, each month that condition continues is a separate violation subject to imposition of a civil penalty. No language regarding continuing violations appears n ORS 540.995 (1), thus indicating no ultimate fines exceeding $2000 can be imposed regarding construction, impoundment, removal, and emergency action plans. The Rules applying civil penalties not defined and counter-indicated in the Statute are without support. These Rules also places a huge financial liability and burden on dam owners.

A suggested alternative to the Rules' enormous costs on dam owners is to limit the requirements involving costs strictly within the Statute's language. This would avoid most engineer costs. Another method is to limit requirements as to preliminary plans, maps, reporting to only that which is actually required in the Statute, not as interpreted more broadly by the Rules. Another method would be to temper the requirements by the actual condition in which the dam is

kept. A dam owner who maintains his dam owner or has complied to the best of his ability with dam safety should not be treated the same as a dam owner who has a dam that is not well maintained. Finally, the financial ability of the dam owner should be considered.

The Civil penalties should be those in the Statute and no more. The interpretation of the penalties to as much as $730,000 per year to an infinite number should be removed. Use the amounts listed in the Statute as the final amount; not as a daily or monthly amount except as to maintenance where a monthly fine is applied specifically to a continuing violation. The fines were never intended by those who participated in the drafting of this Statute as anything but final amounts.[5]

The huge costs and civil penalties will cause dam owners who are mostly small businesses to simply drain their dams or try to sell them. It will end their businesses.

Comments as to Specific Sections of the Proposed Rules

690-020-0022 (Definitions)

The definition of "Modification," appearing under (27) in the Rule should be changed because it does not reflect the Statute's statement about "Modification."

The definitions section of the Statute defines "modification" under "Construct." ORS 540.433 (1) provides that "modifications to a dam"

> (A) Do not include modifying dam height, performing maintenance actions or removing a dam;
> (B) Have a potential impact on the safe functioning of the dam; and
> (C) Are to an extent that the modified dam structures no longer conform to the original design.

The definition in the Rules should conform. The attempt to restate confuses the definition.

690-020-0043 (Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit(s) of Flow through Conduits)

2(b) presently states that "seepage collars may not be used in any dam." But the Section is suppose to apply only to New Dams or Dams modified to increase height. Therefor the section should be removed or changed to state:

> Seepage collars may not be used in any New Dams or where a dam is modified to increase its height.

[5] If the Department considered them as daily or monthly amounts, the Department did not so indicate.

690-020-0070 (New Dams or to Increase Dam Height: Submittals and Notification by the Engineer of Record)

(4) of the proposed Rule states that the Engineer of Record must submit the final Emergency Action Plan (EAP) prior to commencing construction. (4) should be removed as the Emergency Action Plan requirements stated in ORS 540.482 provide differently. The Statute states specifically that the dam owner, not anyone else, shall develop the emergency action plan and file it in three places. Moreover the EAP section requires that the owner of a high hazard rated dam "develop" the EAP. This is the duty of the owner, not an engineer. The Rule language conflicts with the Statute. The Rule language should be removed.[6]

690-020-0100 Hazard Rating of Dams

(2) of 690-020-0100 defining the basis for a High Hazard Rating

Rule 690-020-0100 expands the definition of High Hazard provided by the definition in the Statute, ORS 540.443(5), beyond the definition that High Hazard means expectation of loss of life should a dam fail. WRD previously said it agreed, but that (2) only interpreted when loss of life would occur. This is not clear in 690-020-100 which does not include the definition of "High Hazard" nor state that the Rule is the Department's interpretation of when loss of life is expected to occur. A dam owner is likely confused. The definition is not given nor the purpose of the Rule explained. (2) should be omitted.

WRD has also added language concerning water velocity and water of 1 foot depth in recreational and other areas downstream in its High Hazard definition. This is entirely new and does not anywhere relate to "High Hazard" as expectation of loss of life. This language should be deleted.

(6) of 690-020-100 concerning the requirements of a dam owner if it requests department explanation of Hazard Rating.

The Proposed Rule reads:

> (6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inundation analysis, in support of this request.

This is not in accord with the previously announced intention of the Department to work with the owner.

The Proposed Rule does not require that the Department explain its rating change. It does not require the Department to present the evidence; it only provides that the dam owner may ask the Department consider its rating, not do anything about it. And it provides no cooperative method

[6] See also discussion under 690-020-0400 Emergency Action Plans (EAP), at pp. 9-10.

for the Department and owner to discuss and resolve the situation. The Department has said that it will work with owners, but its proposed rule does not so indicate or require.

690-020-120 Dam Breach Inundation Analysis

This Section has been drastically changed from previous drafts. The previous drafts applied only to New Dams and Increases to Height**.** This new rule applies to all dams. The rule is also unclear. It should be deleted or revised to be clear **and** apply only to New Dams and Increases to Height of Dams.

690-020-140 Modifications of Dams

First, this Rule is confusing and in places not within the Statute. The Rule deals with Modifications of Dams, but does not provide the definition of "Modification" nor any reference to the definition in the statute, ORS 540.443(1). One reading this Rule likely understands it applies to all changes in dams. This is simply outside the Statute. The reader is misled by the Rule and would be much better served by the Statute.

The definitions section of the Statute defines "modification" under "Construct." It provides that modifications to a dam:

(A) Do not include modifying dam height, performing maintenance actions or removing a dam;
(B) Have a potential impact on the safe functioning of the dam; and
(C) Are to an extent that the modified dam structures no longer conform to the original design.

ORS 540.443(1).

The inclusion of the word "and" in (1)(c) is important. It requires that all three conditions must be present to count as "modification:" namely (1) modification does not include performing maintenance actions or removing a dam, (2) the modification must also have a potential impact on safe functioning of the dam and (3) the modification would cause the dam to no longer conform to the original design. The definition of the term modification is limited in the Statute. The Rules cannot apply beyond the Statute. The public and dam owner are better served by the words of the Statute than the misleading directives of the Rule.

Second, many of the provisions under 690-020-0100 (2), (3), (4), (5), and (6) are excluded from modifications by the Statute, ORS 540.443 (1), as quoted above.

For instance (2)(a), 2(b), 2(d), and 2(f) are maintenance actions excluded by (1)(c)(A) of the Statute. (2)(c) and (2)(e) include actions that may be excluded by ORS 540.443 (1)(c)(C) if the actions conform to the original design.

The same applies (3), (4), (5), and (6). For instance (5) that states that the State Engineer will determine the design and submittal requirements for modifications is outside the Statute as it apparently applies to all changes as a reasonable reading of the Rule indicates.

The section 690-020-0140 should be removed from the Rules. The Dam owner and public are better served by the Statute than the confusing and overbroad Rule.

690-020-0340 Potentially Unsafe or Unsafe Conditions

First, "Potentially Unsafe" and "Unsafe" are terms defined in ORS 540.443(7) and (9). The Rules do not reflect the definitions stated at ORS 540.443(7) and (9). The list of potentially unsafe and unsafe conditions are limited to the Statutory definitions. The Rules do not include the Statute's definitions nor is the list related to the definition of unsafe, the dam cannot withstand an earthquake or extreme flooding and has a high risk of internal erosion.

The second sentence in (1) of the Rules should be omitted. The Statute does not require that the Department **must use** all remedies to address unsafe conditions. The ORS 540.458 and ORS 540.461 lay forth detailed procedures and steps that the Department must follow. The second sentence in (1) ignores the details of the Statute that the Department must follow.

Second, ORS 540.458, ORS 540.461, and ORS 540.464 regarding Corrective Action for Unsafe and Potentially Unsafe Conditions are detailed and specific. This was the result of an amendment process directed by the Chair of the Natural Resources Committee in Winter and Spring 2019. The Rules concerning Corrective Action place more requirements on the owner than stated in the Statute, omit items that the Department consider in looking at and making determination on plans for corrective action per the Statute, and are confusing where the Statute is clear.

For example (6), (7), and (8) of the Rules misstate terms in the Statute, leave out provisions required by the Statute, and add provisions to the Statute. For instance Section (8) of the Rules provides that "[i]ssuance of a proposed final order does not preclude the Department from pursuing any and all lawful remedies as **the Department may determine** are necessary to protect life, property or public infrastructure including but not limited seeking injunctive relief in the circuit court.' This is a misstatement and overstatement of the requirements for applying for an injunction as detailed in ORS 540.473. The Statute limits application to when the the Department has information that a person is violating a final order issued under ORS 540.461 or the Department concludes that a dam poses an imminent risk to life, property or public infrastructure. Then the Department may apply to a circuit court dependent are where the dam is located for an injunction. ORS 540.473 does not provide that the Department can pursue specific other means. The Rules are limited to the Statute and do not extend beyond it.

The Rules do not accord with the detailed procedure and terms in the Statute. These terms were a part of the legislatively directed amendment process. The Rules must state what is in the Statute. The public and dam owners are ill served by overbroad Rules. If the Rules remain, they must reflect the Statute.

Emergency Actions and Emergencies (690-020-0400, 690-020-410, and 690-020-0420)

These sections of the Proposed Rules all regard Emergency Actions and Emergencies applying to dam owners. The procedures were first stated in a 2017 statute that was included in ORS 540.479, ORS 540.482, and ORS 540.485.

The Rules include requirements that conflict with the 2019 Statute and give the Department powers not in the Statute. The Rules should be removed and the Statute repeated. The Statute is straightforward and informs dam owners of requirements placed on them. The Rules are complicated, misleading, and provide power to the Department and impose requirements on dam owners both of which do not exist in the Statute. The public and dam owners are better served by the Statute.

690-020-0400 Emergency Action Plans (EAP)

Sections (1), (2), and (3) of the Rules include requirements and provisions not in ORS 540.482.

Section (1) of the Rule states that the final EAP for new Dams or where Dam height is modified must be reviewed and approved by the State Engineer. This is contrary to Statute that specifically states the dam owner with a high hazard dam shall develop the EAP (ORS 540.482(1)). And the Statute states what the dam owner must include in the EAP ORS (540.482(2)). It also states that the owner file the plan with the Department (ORS 540.482(3)). The Statute does not require that the State Engineer review and approve the EAP. This requirement is without authority in the Statute and conflicts with the directive of the Statute. It should be removed.

Sections (2) and (3) of the Rule direct that a draft EAP is required prior to completion of new Dam construction and that a final EAP must be submitted prior to filling a new reservoir and must be reviewed and approved by the State Engineer. Again the Statute regarding EAP's does not include such requirements. And they are in conflict with the plain meaning of the Statute that dam owners develop EAPs and that the dam owners include specific provisions within them. ORS 540.482.

With regard to the statutorily required contents of EAPs, (5)(d), (5)(e), and (5)(f), of the Rules fail to accurately set forth the specific requirements of the Statute (ORS 540.482(d), (e), and (f)). And (5)(e) adds requirements not in the Statute. The Statute specifically states that the dam owner include in the EAP "a map of dam failure inundation zones for varying conditions, including, but not limited to, dry weather conditions and high flood conditions". ORS 540.482(e). The Rules include additional requirements not in the Statute, namely that these maps must use inundation analysis specified by the Department and that the Department may require "one inundation map if the dry weather and high flood flows are not substantially different and that the inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section." These requirements are outside the authority of the Department to impose, are not included in the specific requirements of the Statute for EAPS by dam owners, and are so expensive and incomprehensible that dam owners cannot comply with the Rule requirements.

Sections (6), (7), and (8) of the Rules similarly do not reflect ORS 540.482 (3), ORS 540.482(4), and ORS 540.485 (1) and consistently misrepresent the Statute and impose requirements not found in the Statute. Moreover (8) of this Rule is repeated more accurately in another section of the Rules, 690-020-0420 Immediate Action to Prevent Dam Failure. Accordingly (8) of 690-020-0400 should be removed. It confuses dam owners to repeat requirements and once inaccurately as explained below. Section (6) and (7) should be revised to reflect the Statute or removed.

The public and dam owners would be better served by a recitation of or reference to the Statute than imposition of the overreaching, confusing, and misrepresentative statements of the Rules.

690-020-410 Emergency Actions for Significant Hazard Dams

The provisions of this Rule are repeated more accurately in the following Section of the Rules, 690-020-0420 Immediate Action to Prevent Dam Failure. Accordingly 690-020-0410 should be removed. It confuses dam owners to repeat requirements and sometimes do so inaccurately as explained below.

(1)(a) of the Rules states that the dam owner shall "notify the local emergency services agency, the Department and Persons in areas where the potential for Dam Failure creates risk to life, property, or public infrastructure **by telephone or other methods that ensure immediate notification.**" The words in bold do not appear in ORS 540.485 (2) and, in fact, contradict the Statute. ORS 540.485 (2) states:

(2) If an actual or potential dam failure creates an imminent risk to life, property or public infrastructure, and no emergency plan exists for the dam, the dam owner shall immediately:

(a) Notify by telephone or other method that ensures immediate notification:

(A) If the dam a significant hazard rating, the local emergency services agency for the county where the dam is located;

(B) The Water Resources Department; and

(C) **To the extent practicable, persons in areas where the potential for dam failure creates a risk to life, property or public infrastructure** [Emphasis added.]; and

(b) Take all practicable actions to prevent dam failure.

The words from the Statute that are bolded reflect that dam owners of dams without EAPs are required to take practicable steps to notify residents downstream. They are not required to notify them by telephone or methods that ensure immediate notification. The Rule again imposes requirements that are not in the Statute. A dam owner does not know all persons in the area and cannot reach them. That is why he contacts local emergency services. The Rule imposes an impossible burden that is not in the Statute.

In addition the Rule's heading states it concerns Emergency Actions for Significant Hazard Dams, but the Statute mentions Significant Hazard Dam only with regard to the requirement that the dam owner notify the local emergency services agency for the county where the dam is located.

The Statute is clearer than the Rule and the Rule does not follow the Statute. The dam owner is better served by reading the Statute, not the confusing Rule. The Rule should be removed.

690-020-0420 Immediate Action to Prevent Dam Failure

The Rule summary that the rule describes "Water Resources Department action in an emergency at a Dam rated High or Significant Hazard" is inaccurate. The Rule as written applies to Emergency Actions at Dams. The summary should be so revised.

Section (1), (2), and (3) repeat information given in 690-020-0400(8) and 690-020-0410. But the version in 690-020-0420 is more accurate and follows the Statute. Accordingly 690-020-0400 (8) and all of 690-020-0410 should be removed. Dealing with the same issue twice and different ways makes the Rules confusing.

Significant Hazard Rated dams are not required to have Emergency Action Plans. The dam owner of a Significant Hazard Dam should be informed that he does not need at EAP. Without such an explanation the Rules may be interpreted to require otherwise.

(4) of the Rule misstates the actual actions the Department may take and it misstates the sequencing of these actions. The Rules must accurately state the Statute. A comparison of the Statute and the Rule, with differences in the Rule indicated in italics and highlighted, reflect this:

ORS 540.485	Rule Provision
(3) If the department is aware of conditions that indicate the need for immediate action to prevent dam failure, the department may advise the owner or operator of the dam or the individual in immediate charge of the dam regarding the actions necessary to prevent the dam failure.	(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, *it may take any immediate action to prevent failure of the Dam.* The Department may: (a) *immediately* contact the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure.

The Rule allows the Department to immediately take any action regarding the dam regardless of the guard rails in the Statute.

ORS 540.485	Rule Provision
(4) The department may communicate and coordinate actions necessary to reduce dam failure. If there is a rapidly increasing leakage or risk of overtopping at a dam that has a significant hazard or high hazard rating, the department may open gates or valves and may siphon or pump	(4)(c) *[Missing first sentence of Statute]* If the *Department observes that* there is a rapidly increasing *leakage risk* of overtopping at a Dam that has a Significant or High Hazard rating, the Department may *perform any or all of the following actions*:

water to reduce the water level in the reservoir. …	(i)Open Gate or Valves and siphon or pump Water to reduce the Water levels in the reservoir; *(ii) Modify approval requirements for emergency construction work;* *(iii) Allow Modification of actions prescribed in an Emergency Action Plan; and* *(iv) Pursue any other lawful remedy.*

The Rules add provisions not included in the Statute and basically give the Department free reign to exceed the Statute in terms of actions and legal remedies. The Rules must be based on the Statute, not exceed it.

ORS 540.485	Rule Provision
(5) If a dam that has a significant hazard rating or high hazard rating presents an imminent risk of dam failure, the department or its agent or representative may enter without notice or permission upon any property that affords access to the dam to the extent entry is reasonable or necessary to allow evaluation of the condition or risk or to under undertake actions described in subsection (4) of this section.	(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, *it may take any immediate action to prevent failure of the Dam.* The Department may: (b) If a Dam has a Significant or High Hazard rating, [*omitted that this applies only to dams that "present an imminent risk of dam failure."]* the Department or its agent*s* or representative*s* may enter *the property* without notice or permission *[omitted "upon any property that affords"] of the pertinent landowner to* access *to* the Dam and evaluate the condition or risk or to undertake necessary actions *[omission – described in section 4 of this section]*. The Department's entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary.

The Rule allows the Department to immediately take any action regarding the dam regardless of any guard rails in the Statute. The Statute also misstates what property the Department can enter without permission. And it fails to mention that the entrance is for only purposes indicated in Section 4 of the Statute.

The Statute is clearer than the Rule and the Rule expands beyond the Statute. The Rule should be removed and the exact provisions of the Statute inserted. Otherwise, the public and dam owners are misled.

690-020-0600 Civil Penalty Assessment for Dam Safety

Please see discussion under **The Costs and Civil Penalties imposed by the proposed Rules are Draconian and not required by the Statute. The Rules should be amended to reflect the statutory requirements only**, pp. 3-5.

Waldensee LLC Comments dated April 6, 2020
regarding the Proposed statement dated February 27, 2020, of the "Need for the Rule(s), Fiscal and Economic Impact"

This February 27, 2020, draft of the "Need for the Rule(s), Fiscal and Economic Impact" differs from previous drafts. It was not provided to the Rules Advisory Committee before its publication and distribution.. Thus, the proposed final document "Need for Rule(s and Fiscal and Economic Impact" was not reviewed by the Rules Advisory Committee.

Waldensee has no practical way to reproduce the February 27, 2020, document to include comments and suggested changes,[1] Waldensee therefore creates a document from the February 27, 2020, filing with its suggested changes and comments. Where possible, Waldensee includes reasons for its draft in the foot notes and sometimes by brackets ([ ]) in the text..

NEED FOR THE RULE(S)[2]

Dams provide a number of benefits such as controlling floods; capturing water for irrigation, municipal, recreation, fisheries; and other purposes. While dams provide a variety of benefits, failure of a dam can result in loss of life and damage to property and infrastructure.[3] Oregon has adopted a dam safety program to ensure dams are designed and maintained to prevent failure. The Oregon Water Resources Department is the state agency charged with overseeing safety of dams across the state that are not regulated by a federal dam safety program.

[4]In 2017, the Oregon legislature passed legislation regarding Emergency Action Plans and actions in Emergencies. In 2019, the Oregon legislature passed House Bill 2085 which included the 2017 statute regarding Emergency Action Plans and Emergencies as well as continuing many provisions of older statutes and greatly increasing the provisions regulating all aspects of dams.[5]

[6]Dams that are 10 feet or more in height and store more than 3 million gallons (9.2) acre-feet) of water are subject to the Dam Safety Program requirement and subject to these proposed rules.[7]

Under the new and existing statutes, and under the proposed rules, Oregon's Dam Safety Program determines each dam's hazard rating based on the potential threat to life and property; sets construction, impoundment, removal and maintenance standards; conducts dam inspections for some categories of dams; and imposes fines. The 2019 statute also requires emergency action plans for dams rated high hazard.[8] Of the approximately 950 dams under state

[1] The February 27, 2020, document was sent in PDF. Waldensee cannot it convert to an editable form.
[2] Only the need for the rule is required to be stated. The language, however, provides history and facts that is likely not all needed.
[3] Removed "and natural resources" because "natural resources" is not in the statute.
[4] New paragraph regarding history.
[5] Changed because the proposed language filed February 27, 2020, does not accurately reflect the 2017 statute.
[6] New paragraph because the subject is different.
[7] Minor changes for grammatical reason and accuracy.
[8] Separated this sentence because the dam owner writes and files the Emergency Action Plan per the statute. The Oregon Water Resources Department has no role in these activities.

jurisdiction, about 75 dams are rated as high hazard, meaning loss of human life is expected should the dam totally fail, while approximately another 150 dams are rated as Significant Hazard, meaning failure is likely to result in damage to property or infrastructure. These numbers change based on ongoing analysis and the creation of downstream risks created by others than dam owners.[9] The hazard rating is not a reflection of the condition of the dam, but rather reflects the potential impacts of total dam failure. A dam can be in good condition and still be assigned a high hazard rating. Well maintained dams, including rated high hazard, have a low risk of failure.[10] [11]

Chapter 390, Oregon Laws 2019, repealed, modified, and continued existing laws and instituted new provisions for dam construction and increasing the height of dams; impoundment; dam removal; coordination between the Department and dam owners; procedures regarding maintenance and corrective actions; imposed civil penalties; and other actions.[12]

Chapter 390 also instituted provisions for the Oregon Water Resources Department to enhance the safety of dams and the protection of life, property and public infrastructure by working with federal, tribal, state, local, and private entities. Those provisions appear at ORS 540.488(3)(c). The Oregon Water Resources Department, like all public agencies and governmental entities, has a duty to protect its citizens in all ways possible. Prevention of risk of loss of life by the Department and all public entities is paramount. And the Department can coordinate with other entities to prevent loss of life under the 2019 statute, ORS 540.488(3)(c), by actions such as preventing building downstream of high hazard dams or the building of new dams in areas where that is expected to result in loss of life in the case of dam breach The Department needs to embrace this ability under this 2019 statute. But the Department has chosen not to do so. It has refused to draft or consider any rules applying ORS 540.488(3)(c).[13]

Provisions of Chapter 390, Oregon Laws 2019 pertaining to dam safety are now codified in statute as ORS 540.443 to 540.491 and ORS 540.995.[14] Dams under the regulation of a federal dam safety program are not subject to these proposed rules. The new law requires rulemaking in order to implement certain provisions and also necessitates updates to existing dam safety rules to conform to the new law. As a result, the Department is conducting this rulemaking.

[9] Dam owners cannot control the actions of others that create downstream risks.
[10] Sentence added as this was what the State Engineer for Water Resources said and it is important to reflect the difficult position in which responsible owners of high hazard rated dams are placed. Even though they maintain their dams well, the new statute and rules place enormous additional financial requirements on them.
[11] Some minor changes in the paragraph relating to grammar.
[12] First sentence of the first full paragraph on page 2 with minor modifications for completeness.
[13] This paragraph includes new language not included in the February 27, 2020, document.
[14] Removed “Consistent with past practice”.

FISCAL AND ECONOMIC IMPACT[15]

The Statute imposes costs on dam owners. The Rules impose enormous additional costs on dam owners.

Emergency Action Plans (EAPS) are required from all High Hazard Dam Owners. The requirements for inclusion in the EAPs, including notification, review, and other matters are detailed. Compliance requires engineers and much communication with the Department. There are also actions required in emergencies including notification, pumping, engagement of engineers, and more actions that increase costs.

Dam owners face new fees for construction and increase in height of an existing dam. The new fees will range between $1750 to $8500 depending on the hazard level assigned to the dam. The Rules impose other plan costs for construction and increase in height of a dam. Finally, there are additional costs related to construction of new dams and increase in height of existing dams.

Dam owners must now apply to the Department to remove a dam. This requires application to the Department and compliance with specific rules as to removal of a dam. No requirements as to removal of a dam previously existed. In one section of the statute, the Department can require an engineer and the Rules propose that the Department can require an engineer in most matters of removal. The statute imposes new costs and the Rules impose additional costs on the dam owner where none existed previously.

The costs on dam owners regarding corrective actions and maintenance actions are also increased. According to the Department these include engineering fees for plans, oversight and reporting. They also require labor and equipment to be paid by dam owners. And they may require attorney fees to review and advise on the new law requirements and to engage in representation of dam owners when the Department takes enforcement actions. The law also enacts civil fines regarding enforcement on the dam owner. Civil fines regarding maintenance actions are from up to $500 per month for maintenance actions and up to $2000 per occurrence for other actions for dams rated high hazard. The Department, in the Rules, say that these fines are per day or month. Thus fines that are $2,000 per day for owners of high risk dams can become $60,000 per month, $730,000 per year, to an infinite amount.

The new rules impose higher costs on all dam owners. These costs can range from small amounts for owners of low risk dams to huge amounts for owners of high risk dams, regardless of the actions such owners have taken and continue to take to keep their dam well maintained. Some of new costs are so high that even dam owners who keep their dams in good condition will either drain them or seek to sell them. And new dams will likely not be built.

[15] The language of the document filed February 27, 2020, has been removed because it largely fails to present the fiscal and economic effects of the rules on dam owners. It has been replaced with suggested language that reflects the fiscal and economic effect on dam owners.

Cost of Compliance

(1)Identify any state agencies, units of local government, and members of the public likely to be economically affected by the rule(s)[16]

State agencies, cities, counties, special districts, individuals, and businesses who own dams or are proposing to build a new dam are subject to these rules if the dam is not under the jurisdiction of a federal dam safety program and the dam meets the height and volume thresholds for regulation by the department. Owners of covered dams will incur costs under these proposed rules for annual fee payments; to construct, increase height, remove, repair, and maintain dams; create and comply with Emergency Action Plans; take Emergency Actions; and pay civil penalties.[17]

In regard to publicly owned dams, there are an estimated 66 publicly owned dams rated as high or significant hazard. Of these, approximately 35 are owned by cities, 23 by special districts or public utilities, 5 by counties and 3 by state agencies. Nine of the 66 dams have known vulnerabilities that render them unsafe or have known or suspected vulnerabilities that may render them potentially unsafe. All dam owners, including these dam owners have been informed of the condition of their dams. All these dam owners will incur costs, likely in the millions of dollars to comply with these Rules. One city is facing costs estimated at about $70,000,000.[18] Over time, there may be additional dams found to be unsafe or potentially unsafe. The owners of these dams will also incur large costs under the Rules. The Rules also authorize enforcement actions and civil fines. Again, such actions and fines will result in costs and fines that can exceed hundreds of thousands of dollars. For example the fines associated with new construction, increase in dam height, impoundment, and removal of high hazard rated dams are $2,000 per day, about $30,000 per month, and $730,000 per year.

Customers and patrons who rely on these public reservoirs for drinking water, irrigation, and other purposes will likely experience corresponding rate increases.

(2) Effect on Small Businesses: (a) Estimate the number and type of small businesses subject to the rule(s)

There are 161 high and significant hazard dams regulated under the dam safety program that are privately owned. Of the 161 high hazard and significant hazard privately owned dams, an estimated 105 are owned by small businesses mostly for farm and ranch use and other commercial purposes. The remaining 56 dams are owned by corporations, which are or may also be small businesses, for manufacturing, industrial, or power generation uses; by homeowner associations; by individuals for water consumption, irrigation, water control, or farm or ranch use. All these entities including small businesses incur costs under these rules for annual fee payments; to construct, increase height, remove, repair, and maintain dams; create and comply with Emergency Action Plans; take Emergency Action; and pay civil penalties.[19]

[16] (1), (2), and (3) of Cost of Compliance have been separated and separately dealt with here to specifically deal with each topic. The February 27, 2020, draft had them all combined.

[17] Removed the next sentence and the next paragraph as low risk dams do not appear to be covered according to the language of this paragraph and that in the first paragraph under "Need for the Rules." If the rules apply to dams rated low hazard, then that needs to be specifically stated, namely as to what costs are incurred for low hazard rated dams.

[18] The correct amount should be included if this amount is incorrect..

[19] Revised the paragraph to reflect the purposes of dams and list costs incurred under the rules.

(2) Effect on Small Businesses: (b) Describe the expected reporting, recordkeeping and administrative activities and cost required to comply with the rule(s)

Dam owners, including small businesses are required to notify the Department if the contact information changes or after completing a transfer of title on the dam. The owner is required to draft, complete, and file an emergency action plan with three public entities. The owner is required to observe, maintain, and report certain conditions of the dam. The owner is required to take emergency actions where required. The owner is required to pay fees ($100 for a low hazard dam, $200 for a significant hazard dam, and $670 for a high hazard dam) and these fees rise over time. Dam owners seeking to build a dam or increase the height of their dam must pay fees expected by the Department to range from $1750 to $8500. Dam owners must keep records. All these requirements mean labor for administrative costs depending on the size of the dam of up to tens of thousands for administrative costs. These costs are only part of the costs to comply with the Rules. Other costs are discussed below and above.[20]

(2) Effect on Small Businesses: (c) Estimate the cost of professional services, equipment, supplies, labor and increased administration to comply with the rule(s)

Dam owners, including small businesses, may incur costs to comply with the Rules for professional services, equipment, supplies, and labor in order to undertake actions related to construction, maintenance, repair, removal, development of emergency action plans, and taking emergency action. These costs include the engagement of the services of professional engineers, knowledgeable attorneys, and labor, particularly for high or significant hazard dams. These costs can range up to hundreds of thousands of dollars.[21]

Dam owners, including small businesses, must evaluate the conditions of the dam and make repairs and maintain the dam. The rules impose new requirements and penalties on dam owners regarding maintenance, Emergency Action Plans, emergency actions, and corrective actions. These new rules require more labor, administrative time and work, and equipment. In short, the new rules require additional cost for labor, administrative work, and equipment.[22]

The rules require the Dam Owner, including small businesses, to take immediate action in times of imminent breach or an unsafe dam. The new rules shorten the time for hearing or remove it altogether in some instances. These changes are likely very expensive for the dam owner as it must use engineers, buy or rent expensive equipment, and pay labor. The Dam Owner must also hire attorneys with regard to the shortened or non-existent time for hearing or to oppose imposed Department actions that may not be necessary.[23]

Under the proposed rules, owners of high and significant hazard rated dams, including small businesses, that wish or need to remove a dam would need to have a removal plan reviewed and accepted by the Department. There are costs to develop the plan and interact with the Department. These include, most likely, engineering costs. They also include administrative

[20] Revised the paragraph to include costs incurred by dam owners, including small businesses.
[21] Rewrite of the first full paragraph on page 5 of the proposed language to shorten, simplify, and state the extent , in general, of fees and labor costs.
[22] Rewrite of the second full paragraph on page 5 of the proposed language to basically remove language about dam owners that does not address the subject of (2)(c).
[23] Rewrite of the third full paragraph on page 5 of the proposed language to basically remove language about dam owners that does not address the subject of (2)(c).

costs and expenses. The Department estimates that the costs associated with developing a removal plan can be up to $30,000 for a high hazard dam.[24]

Owners of high hazard rated dams, including small businesses, must complete emergency action plans under the Rules and possibly update them. The costs of creating a new emergency action plan include engineering costs to develop the plan and gather or create an inundation analysis. The cost of updating an emergency action plan likely requires engineering costs for the rewrite and a new inundation analysis if necessary. Knowledgeable attorneys are necessary to review and explain the rules and statute requirements and possibly write the new plan or updated plan. The professional costs and administrative costs of a new plan could range up to $50,000.[25]

In addition to the professional, labor, and administrative costs, dam owners, including small businesses, the rules impose civil penalties and shorter periods of time to respond to enforcement action. The civil penalties as explained above allow imposition of civil fines of from $500 to up to $2,000 per day for dams rated high hazard (about $30,000 per month, and $730,000 per year). These fines and the shorter time periods make knowledgeable attorneys a practically required expense.[26]

DESCRIBE HOW SMALL BUSINESSES WERE INVOLVED IN THE DEVELOPMENT OF THESE RULE(S)

[Add as third sentence the following.] Although the Rules Advisory Committee was provided with earlier drafts of the Fiscal and Need and Costs of the Rule(s), it was not provided with the February 27, 2020, document until it was published and after Rules Advisory Committee meetings had ended. The February 27, 2020, document includes extensive changes drafted by the Department. Therefore, the Committee had no opportunity to review and weigh in on the proposed Need and Fiscal Empact document of published February 27, 2020.

Was an Administrative Rule Advisory Committee Consulted?

Yes, but see the statement above as to the inability of the Rule Advisory Committee to comment after the extensively revised Need for the Rule(s) and Fiscal and Economic Costs document was published on February 27, 2020.[27]

[24] Limited rewrite of the fourth full paragraph on page 5 of the proposed language for accuracy.
[25] Limited rewrite of the fifth full paragraph on page 5 of the proposed language for accuracy. The reference to significant hazard dams was removed as the requirement for an EAP applies only to High Hazard rated dams.
[26] Rewrite of the first full paragraph on page 6 of the proposed language to accurately reflect the cost of civil fines on all dam owners and the need for attorneys.
[27] Added everything after "Yes" to reflect what is there stated.

May 6, 2020

To: Racquel Rancier, Oregon Water Resources Department
725 Summer St. NE, Suite A,
Salem, OR 97301-1271
Email: racquel.r.rancier@oregon.gov

Re: Proposed Rules: Safety of Dams including Design, Construction, Maintenance, Corrective Action, Removal, and Emergencies – **Support**

The League of Women Voters of Oregon believes that all levels of government share the responsibility of coordinating, implementing and funding an effective program to mitigate Oregon's earthquake and tsunami hazards. Priority must be given to mitigation that protects human life and safeguards critical life support systems. This position was adopted in 1995 and we have consistently argued for both public education and government investments to address this critical public safety issue since that adoption.

In 2019, as in previous sessions, we engaged in the issue of dam safety (HB 2085), acknowledging the responsibility of government to evaluate dams *"…that threaten population centers and taking remedial actions such as reinforcing dams, and developing maps and downstream notification procedures."* In 2020 we supported SB 1537 which would have provided funding to aggressively address dam safety issues in Oregon.

We were privileged to participate in the advisory committee for these proposed rules. The membership of the committee was broad-based with expertise related to the various issues addressed in these proposed rules. It is time to update and expand the Water Resources Department's dam safety rules on behalf of Oregonians.

Thank you for the opportunity to discuss these proposed rules. We ask that the Water Resources Commission **adopt** these important public safety rules.

Rebecca L. Gladstone

Rebecca Gladstone
LWVOR President

Peggy Lynch

Peggy Lynch
LWVOR Natural Resources Coordinator

WASHINGTON COUNTY
OREGON

Date: May 18, 2020

From: Washington County Emergency Management
To: Raquel Rancier, Oregon Water Resources Department

Subj: Notice of Proposed Rulemaking, OAR 690, Division 20, Dam Safety

Thank you for the opportunity to comment on the Notice of Proposed Rulemaking regarding the safety of dams (OAR 690, Division 20). Based on a thorough review of the proposed changes, we would like to offer the following substantive and editorial comments and recommendations:

General:

- Recommend that sections 690-020-100, Hazard Rating of Dams, and Section 690-020-0120, Dam Breach Inundation Analysis, be moved back in sequence so they come after the sections on Modification of Dams and Dam Removal and before the section on Maintenance of Dams. This will put all the design and construction requirements up front and move the support, operations, and administrative requirements towards the back.

Section 690-020-0035

- Recommend removing the word "Minimum" from the section title. None of the requirements listed in this section are described as minimum. They are the requirements.

Section 690-020-0042

- Recommend removing the word "Minimum" from the section title. None of the requirements listed in this section are described as minimum. They are the requirements.

Section 690-020-0048

- Recommend changing the title of this section to "Design Requirements for New Dams or to Increase Dam Height: Exceptions". This will make the title consistent with the preceding sections.

Section 690-020-0068

- Paragraph (3)(g) says that operations and maintenance plans must include a water release plan in the event of a flood forecast when the reservoir is above a certain level. The term "certain level" is not a defined term and is not explained in the text. The term needs to be explained and should identify who sets the level.
- Paragraph (3)(i) – Remove the brackets around OAR 690-0250.

Section 690-020-0070

- Recommend changing the title of this section to "Submittal Requirements for New Dams or to Increase Dam Height: Submittal and Notifications by the Engineer of Record". This will make the title consistent with the preceding sections.

Section 690-020-0080

- Recommend changing the title of this section to "Approval Requirements for New Dams or to Increase Dam Height: Written Approval by State Engineer". This will make the title consistent with the preceding sections.
- Paragraph (1) states that "No person shall Construct a Dam unless…" As used here, the word "Construct" is a defined term that applies to more than just new dams and dam raises. It includes other dam modifications as well. Since section 690-020-0080 only addresses new dams and dam raises, the word "Construct" should not be used in this paragraph and should be replaced with other appropriate wording.

Section 690-020-0100

- Paragraph (2) – Capitalize the word "rating"
- Paragraph (2)(a), Second Sentence – The sentence is a little awkward and appears to be missing a word. It might be improved simply by adding the word "in" before the word "establishing". It would then read "The Department may also consider Water velocity in its determination of inundation depth in establishing…"
- Paragraph (5), Second Sentence – The words "breach inundation analyses" are not defined terms and should not be capitalized.
- Paragraph (5), Second Sentence – The sentence needs to be reworded to correctly state the Department's action. It currently reads "The Department may conduct Hazard Rating reviews and Dam breach inundation analyses as evidence indicates…" If the Department actually conducts either reviews or analyses, then it would "<u>utilize them as evidence</u> <u>indicating</u>…."

Section 690-020-0140

- Paragraph (1) – The word "Modify" is not a defined term and should not be capitalized.
- Paragraph (2) – The word "modification" is a defined term and should be capitalized.
- Paragraph (3) – The word "modification" is a defined term and should be capitalized.
- Paragraph (3)(a) – Remove the parentheses around OAR 690-020 0037 and add a hyphen between 020 and 0037.

- Paragraph (6), First Sentence – The word “modification” is a defined term and should be capitalized.
- Paragraph (6), Second Sentence – The words “or modifying Dam Height” should not be included here. By definition, changing a dam’s height is not a Dam Modification. And since this section deals with Dam Modifications, it should not include a mention of changes in dam height.

Section 690-020-0160

- Recommend changing the title of this section to Dam Removal.
- Paragraph (3)(c) – Timeframe is one word not two.
- Paragraph (3)(e), First Sentence – Delete the commas after the words “location” and “slopes” and insert the word “and” between the words “location” and “breach”.
- Paragraph (3)(e), Second Sentence – Insert the word “be” between the words “will’ and “sufficient”.
- Paragraph (4) – Simplify by changing the words “that the plan” to “it”.
- Paragraph (5) – The defined term “Modification” is used incorrectly twice in this paragraph. Recommend changing the words to “alteration of” or “amendments to”.

Section 690-020-0250

- Paragraph (3) – This is a hanging sentence and has a word that should be capitalized (i.e., dam). Recommend changing the sentence to read “The Dam owner shall maintain records as needed to track Dam conditions.”

Section 690-020-0260

- Paragraphs (2)(b) and (c) – Consider changing the numbers “3” and “6” to the words “three” and “six”.

Section 690-020-0310

- Paragraph (1) – Capitalize the words “dam”, “dams”, and “low hazard dams”.
- Paragraph (2)(a) – The term “Stipulated Correction Plan” is introduced here for the first time then utilized many more times in this section. It is not a defined term, is not defined or explained elsewhere, and is not linked to an ORS where it is likely defined.
- Paragraph (2)(a), Third Sentence – Consider changing the word “are” to “must be”.

Section 690-020-0340

- Paragraph (1) – Insert the word “Hazard” after the word “Significant” and capitalize the words “rated”, “unsafe”, and “potentially unsafe”.
- Paragraph (1), Second Sentence – Consider changing the word “must” to “may”.
- Paragraph (2)(f) – Insert OAR before 690-020-0037.
- Paragraph (2)(g) – The word “invert” doesn’t make sense unless it’s a technical term. Regardless, consider changing it to something that is correct or less technical.
- Paragraph (4) – The word “Conditions” should not be capitalized.
- Paragraph (4)(a)(i) and (ii) – Capitalize the words “unsafe” and “potentially unsafe”.

- Paragraph (4)(b) – Capitalize the words “unsafe” and “potentially unsafe”.
- Paragraph (4)(b) – The term “consent order” is introduced here for the first time then utilized again in this paragraph and in subsequent paragraphs. It is not a defined term, is not defined or explained elsewhere, and is not linked to an ORS where it is likely defined. I recommend the term be capitalized here and that it be linked to an ORS for definition or be added to the definitions sections as a defined term.
- Paragraph (5) – The term “Proposed Final Order” is introduced here for the first time then utilized many more times in subsequent paragraphs. It is not a defined term but there is clarifying information in section 690-020-0460. I recommend adding a note e.g., (per OAR 690-020-0460), after the first use of the term.
- Paragraph (5) – Capitalize the term “Consent Order”.
- Paragraph (5) – Delete the words “in the event” in its second use near the end of the sentence.
- Paragraph (5)(a) – Capitalize “proposed final order”, “unsafe”, “potentially unsafe”, and “contested case hearing”.
- Paragraph (5)(b) – Capitalize “proposed final order”.
- Paragraph (5)(b)(i), (ii), and (iii) – Capitalize “unsafe” and “potentially unsafe”.
- Paragraph (5)(b)(vi) – Add the word “A” at the beginning of the sentence and make the second word lower case.
- Paragraph (5)(b)(vi) – Capitalize “unsafe” and “potentially unsafe”.
- Paragraph (5)(b)(vi), Second Sentence – Consider changing the words ”provisions requiring the” to “requirement for”.
- Paragraph (5)(b)(vi), Second Sentence – Delete the word “the” from this phrase ”ability to the use” and consider deleting the words “which is” later in the sentence.
- Paragraph (6) – Capitalize “proposed final order” in both cases and capitalize the word “order” following the word “Consent”.
- Paragraph (7) – Capitalize “proposed final order”, add a comma after “proposed final order”, and capitalize “contested case hearing” in both cases.
- Paragraph (7)(a) – Capitalize “unsafe” and “potentially unsafe” and add the word “a” after the words “may pose”.
- Paragraph (7)(b) – Capitalize “contested case hearing”, “unsafe”, and “potentially unsafe”.
- Paragraph (8) – Capitalize “proposed final order”.
- Paragraph (9) – Capitalize “proposed final order”.

Section 690-020-0400

- General – Paragraphs (1) - (3) are overlapping and a bit confusing. For example, the last sentence in paragraph (1) is nearly identical to the last sentence of paragraph (3). They could be clarified by turning them into four paragraphs with #1 stating the EAP requirement and purpose, #2 indicating when a draft EAP is required, #3 indicating when a final EAP is required, and #4 stating that the final EAP must be reviewed and approved by the State Engineer. All paragraphs should consider new dams and dam raises.

- Paragraph (1) – Capitalize the word “height” and consider changing the words “to ensure” to “in protecting”.
- Paragraph (5)(b) and (c) – Both refer to emergency levels and levels of emergency. However, “emergency level” is not a defined term and is not explained elsewhere in the proposed rules. If “emergency level” is defined in some other OAR or in ORS, then it should be referenced here.
- Paragraph (5)(e) – Consider changing the word “require” to “allow”.
- Paragraph (6) – Add the word “and” between “Department” and “”the Office”, delete the comma after “Emergency Management”, and change the word “agency” to “agencies” since there are always two or more emergency services agencies interested in the dam EAPs (fire, law, and public works).
- Paragraph (7) – Change “local emergency managers” to “local emergency management and emergency services agencies”.

Section 690-020-0410

- General – It seems this section could be eliminated by merging it into the subsequent section. Much of the language is already duplicated in 690-020-0420.
- Paragraph (1) – Change “agency” to “agencies”.

Section 690-020-0420

- Paragraph (2)(a) – Change “agency” to “agencies”.
- Paragraph (2)(c) – Capitalize “failure”.
- Paragraph (3) – Capitalize “failure”.
- Paragraph (4)(b) – Add the word “to” after the word “notice”.
- Paragraph (4)(c) – Change the word “of” to “or” between the words “risk” and “overtopping”.
- Paragraph (4)(c)(C) – The word Modification is a defined term that should not be used in this context. Recommend changing it to “alteration” or a similar term.

Section 690-020-0460

- General – Capitalize the following words and terms everywhere they appear in this section: “proposed final order”, “contested case hearing”, “unsafe”, and “potentially unsafe”.
- Paragraph (3) – Recommend rewording the first part of the sentence to read “Contested Case Hearings involving requests for hearing related to Proposed Final Orders…”
- Paragraph (5) – Add a comma after the word “party” and change the word “file” to “submit”.

Section 690-020-0600

- General – It’s unclear from the text if the Department can assess a civil penalty for raising the height of a dam or making other modifications without approval. I suspect it can. Construction of a dam is specifically listed but that doesn’t necessarily include a dam raise (or lowering) since the word “construction” used in (1)(a) is not a defined

term. If the word "Construct" was used, that's a defined term that means building new, modifying the height, or making other modifications. Regardless, if the Department can assess a civil penalty for changing the height and/or making other modifications, the text in paragraphs (1) and (2) needs to be clarified.

- General – The word "remit" is used in several paragraphs when referring to the Department's civil penalty authorities. I think the meaning of the word in these cases is to cancel or refrain from assessing. While that is one definition of the word remit, the more commonly used definition and the one most people would associate it with is to submit or send in. For that reason, the word should be changed to reflect the intent. Words like cancel or waive should be considered.
- Paragraph (1)(a) – Add "OAR" before "690-020-0080(1)".
- Paragraph (1)(b) – Add "OAR" before "690-020-0080(4)".
- Paragraph (1)(c) – Delete the redundant words "rated as High or Significant Hazard" and add "OAR" before "690-020-0160".
- Paragraph (1)(d) – Change to read as follows: "Failure to file an Emergency Action Plan with the Department and the Office of Emergency Management and local emergency services agencies for the county where the dam is located, as provided in OAR 690-020-0400.
- Paragraph (1)(e) – Add "OAR" before "690-020-0310".
- Paragraph (4) – Consider changing the word "modified" to "approved" and add a period at the end of the sentence.
- Paragraph (5) – Change the latter part of the sentence to read as follows: "….with the Department and the Office of Emergency Management and local emergency services agencies for the county where the dam is located shall be $2000.
- Paragraph (6), Subparagraphs (a) - (d) – The last sentence in each of these subparagraphs conveys the same information but each of them is worded differently. Each of them should be worded the same to avoid confusion.
- Paragraph (6)(e) – Civil Penalty should not be capitalized. It isn't a defined term.

WALDENSEE, LLC
4308 Orchard Heights Rd. N.W.
Salem, Oregon 97304

May 28, 2020

via e-mail to Breeze.K.Potter@oregon.gov
Breeze K Potter
Water Policy Analyst
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem OR 97301

via e-mail toRacquel.R.Rancier@oregon.gov
Rules Coordinator
Oregon Water Resources Department
725 summer Street NE, Suite A
Salem OR 97301

Dear Ms. Potter and Ms. Rancier:

Waldensee LLC sends this document to you per instructions from Ms. Rancier on May 27, 2020, and Keith Mills on May 28, 2020.

Waldensee LLC is submitting these comments in accord with the Notice of Proposed Rulemaking Including Statement of Need and Fiscal Impact, Chapter 690, Water Resources Department filed April 29, 2020.[1] This letter concerns the Proposed Rules. It includes comments provided and filed on April 6, 2020, and some additional comments.

The Proposed Rules do not include Rules concerning ORS 540.488 (3)(c).

ORS 540.488(3)(c) provides:

> (3) In addition to any other powers of the department [Oregon Water Resources Department], in carrying out department duties, functions and powers under ORS 540.443 to 540.491, the department may:
> (c) Coordinate with federal, tribal, state, local and private entities to enhance the safety of dams or the protection of life, property or public infrastructure in areas below dams.

ORS 540.488 (1) provides that the Oregon Water Resources Department (the Department) may adopt Rules for the administration of ORS 540.443 to 540.491. Thus, the Department has powers to work with public and private entities to protect life, property and public infrastructure

[1] The April 29, 2020 Proposed Rules do not appear to be substantively changed from the February 27, 2020 Proposed Rules. There are some rule deletions and additions and some changes in statute references. But the deletions and additions basically add up to the February 27, 2020, Proposed Rules in substance.

in areas below dams. Yet the Department has not included any Rules addressing the responsibility of the Department and other public entities to do so. It should do so.

The Department's work with other governmental and private entities is important to protecting life, property and public infrastructure. And here the Legislature has said that the Department can do so.[2] For example, when a local entity's actions place lives and property in harms' way, however remote, by allowing construction of a house in the outflow stream and area of inundation one-quarter mile from a high hazard dam, the Department as well as the local government should cooperate and work to not have this occur.[3] It is government's responsibility at all levels to protect citizens.

The responsibility of public safety does not lay solely with dam owners. It also lies with public entities such as the Department. The Department's responsibility does not apply only to regulating dams. It also extends to protecting life by not allowing situations and taking all measures possible to avoid harm including simply not allowing a situation such as building houses in an inundation zone below a dam that could, however remotely, cause loss of life. The Department should embrace this opportunity and take responsibility to protect citizens. This provision of ORS 540.488(3)(c) specifically provides this opportunity. The Department and the Rules should provide that the Department will take action to protect citizens in these Rules.

The Department has repeatedly declined requests for the inclusion of Rules to address ORS 540.488(3)(c). It has stated that it is not financially able to do so. The Department requires dam owners to expend much money on costs as required by these Rules. It also performs inspections, writes reports, pursued this legislation, issues various orders to dam owners, and seeks to enforce those orders and assign civil penalties and collect them.[4] The stated purpose of the heavy and much increased requirements on owner is safety. But the Department refuses to take action and provide Rules for such action that it can take for safety of citizens and to prevent unsafe conditions for citizens even when the Statute provides such. Money spent by the Department on prevention is much more effective than requiring dam owners to bear increased financial burden, including when unsafe conditions are created by public and private entities. The first duty of all public government and entities is to protect its citizens from harm. The Department should be required to do so.

The proposed Rules misstate the Statute's requirements, exceed the scope of the Statute, and do not include all of the Statute's requirements.

The Department's proposed HB 2085 (ultimately ORS 540.443 to 540.491 and ORS 540.995) was hotly contested and debated in Winter and Spring 2019. It was amended. The amendments addressed the original bill's language to require much more Department cooperation with dam owners. It was also changed to amend definitions and to clearly state procedures. There were other amendments.

---

[2] Above and beyond this statutory permission, protecting citizens and property is a basic tenet and underpinning of all government.

[3] This happened in 2019, after a dam owner filed legal objections.

[4] Please see section of these comments related to costs and fines, pp. 3-5.

Many of the proposed Rules have no basis in the Statute and are contradictory to HB 2085 as passed by the Legislature and signed by the Governor (ORS 540.443 to 540.491 and ORS 540.995). The Statute is very detailed, partially as a result of the amendment process, but the Rules do not accurately and completely reflect that detail. The Rules also extend to areas not addressed by the Statute.

The Legislature has authority to legislate. The Department does not. The Department and the Rules cannot address matters not in the Statute nor add requirements not within the scope of the Statute. The Department is an administrative and enforcement agency. The Rules filed on February 27, 2020, and April 29, 2020, extend the Rules beyond the provisions amended during the 2019 Legislative session and passed by the Legislature. By misstating the requirements of ORS 540.443 to 540.491 and ORS 540.995, misstating definitions in the Statute, failing to include Rules with regard to all aspects of the Statute, the Department usurps the authority of the Legislature and Governor. It is seeking to legislate through rule making. Its authority is limited to the Statute.

A recent case provides that the Oregon Water Resources Department must follow the procedure provided in statute and that the Department does not have blanket authority to simply do what it likes. Order with Exhibits filed March 10, 2020, in *Brooks v. Byler et al.*, Marion County Circuit Court Case No. 19CV27798. Rules exceeding the statute also violate due process rights protected under the Fourteenth Amendment to the U.S. Constitution. *Brooks v. Byler*.

HB 2085 is very specific as to many procedures, a product of the amendment process. The Rules misstate many of the procedures and definitions, do not include provisions, and expand enforcement and civil fines specifically delineated in the Statute. For this reason the proposed Rules frequently mislead the dam owner and public, not guide them. Dam owners and the public are much better informed by the Statute, not by the proposed Rules. Another suggestion is to simply put the detailed procedures, the definitions, and civil fines of the Statute in the Rules, not reword and expand the procedures and fines nor make omissions to them.

The Costs and Civil Penalties imposed by the proposed Rules are Draconian and outside by the Statute. The Rules should be amended to reflect the Statutory Requirements.

The Agency has requested comments on "whether other options should be considered for achieving the rules' substantive goals while reducing the economic impact of the rules on business."[5]

The costs of building and maintaining a dam under the proposed Rules are Draconian and unaffordable.

These Rules include increased costs in fees to the Department and increased expenses for construction; new fees and expenses for removal; and costs related to Emergency Action Plans.

[5] Notice of Proposed Rulemaking Including Statement of Need and Fiscal Impact, Chapter 690, Water Resources Department filed February 27, 2020, and April 29, 2020.

The proposed Rules also impose on the dam owner extensive costs for engineers. And the cost of compliance with the Rules in terms of costs for reporting, record keeping, administrative costs, attorneys, equipment, supplies, and labor to maintain the dam for such issues as gopher control, rooty weed control and removal, repairs, installation of gauges, mowing and other grass removal, cleaning spillways, and numerous other activities is huge. Dam owners may simply decide to sell their property or drain their dam. Prospective dam owners will not be able to build needed dams.

In addition, the newly imposed civil fines as misinterpreted by the Rules can cost hundreds of thousands of dollars to dam owners. These dam owners may have legitimate reasons for not immediately complying with Department requirements, but they are left with an ineffective procedure for questioning the orders or the fines. In effect they are left with a choice of immediately complying or facing huge fines and worse. The time to appeal with supporting document to a proposed final order is twenty (20) days and less if the Department claims so. Twenty (20) days is not sufficient time to gather supporting documents, make a written response, and find a needed lawyer. This time limit itself robs dam owners of due process.

The amounts of the civil penalties in the Rules are not supported by the Statute and are astronomical.

The Statute, ORS 540.995, and Proposed Rule 690-020-0600 impose fines based on the category in which the dam falls: High Hazard, Significant Hazard, or Low Hazard. The hazard rating has nothing to do with the condition of a dam. It regards the harm that could occur below the dam should it totally fail. The second paragraph of the April 29, 2020, "Need for Rule(s) and Fiscal and Economic Impact" in the "Need for Rule(s)" section, ends with "[a] dam can be in good condition and still be assigned a high-hazard rating." Neither the hazard rating nor the draconian civil penalties of the rules are tempered by the fact stated by the State Engineer for Water Resources Keith Mills on October 21, 2019, to the Rules Advisory Committee that a "well maintained high hazard dam presents only a remote risk."

The Rules propose civil penalties in multiple amounts of the Statute's stated amounts. As proposed by the Rules, the civil penalties for:

> Beginning construction before approval by the Department of construction and operation documents is $2,000 for High Hazard, $1,000 for Significant Hazard, and $500 for Low Hazard dams.
>
> Impounding water before prior plan submission and final plan acceptance by the Department is $1,000 for High Hazard, $500 for Significant Hazard, and $250 for Low Hazard dams. The Rules propose that these fines are **per day.** Thus the fines amount to about $30,000 per month and $365,000 per year for dams with high hazard rating, about $15,000 per month and $185,250 per years for dams with significant hazard rating. The fines for low hazard rated dams are about $7,500 per month, and $91,250 per year.
>
> Beginning construction work to remove a dam prior to submission and acceptance of the plans by the WRD is $2,000 for High Hazard, $1,000 for Significant Hazard, and $500

for Low Hazard dams. The Rules propose that these fines are **per day.** Thus this fines amounts to about $60,000 per month and $730,000 per year for dams with high hazard rating, about $30,000 per month and $365,000 per years for dams with significant hazard rating.

The penalty if a High Hazard Dam owner does not submit an Emergency Action Plan is $2,000 **per month.** This amounts to $24,000 per year.

Civil penalties for not completing maintenance actions identified by the Department are $250 or $500 (depending on the action **per month** for High Hazard Dams and $150 or $250 (depending on the action) **per month** for Significant Hazard Dams.

The WRD interpretation of these penalties up to $730,000 per year is unfounded in the Statute. No where in ORS 540.995(1) pertaining to construction, impoundment, removal, emergency action plans is any per month or per day civil penalty stated. ORS 540.995(1) provides that the Water Resources Director may impose a civil penalty of not more than $2,000 per occurrence for violation of ORS 540.449 (Construction Plan Approval), ORS 540.452 (Removal Plan approval), and ORS 540.482 (Emergency Action Plan for High Hazard rated dams). ORS540.995 (2) is the only part of the Statute that addresses continuing violations. ORS 540.995 (2) provides the director may impose a civil penalty, not to exceed $500 under ORS 540.467 regarding maintenance actions. The Statute explains that if a maintenance action violation is continuing, each month that condition continues is a separate violation subject to imposition of a civil penalty. No language regarding continuing violations appears n ORS 540.995 (1), thus indicating no ultimate fines exceeding $2000 can be imposed regarding construction, impoundment, removal, and emergency action plans. The Rules applying civil penalties not defined and counter-indicated in the Statute are without support. These Rules place huge financial liability and burden on dam owners.

The Department asks for alternative language for the Proposed Rules. The Proposed Rules should be strictly limited to the Statutory language regarding costs. This would avoid most engineer costs and limit the astronomical fines in the Proposed Rules. It would also limit requirements as to preliminary plans, maps, reporting to only that which is actually required in the Statute, not as interpreted more broadly by the Proposed Rules. Another method to limit costs to dam owners would be to temper the requirements by the actual condition in which the dam is kept. A dam owner who maintains his dam or has complied to the best of his ability with dam safety should not be treated the same as a dam owner who does not maintain dam or take measures to do so. Finally, the financial ability of the dam owner should be considered and monies provided to dam owners who comply within their abilities.

The Civil penalties should be those in the Statute and no more. The interpretation of the penalties to as much as $730,000 per year to an infinite number should be removed. Use the amounts listed in the Statute as the amount; not as a daily or monthly amount except as to maintenance where a monthly fine is applied specifically to a continuing violation.

The huge costs and civil penalties will cause dam owners who are mostly small businesses to simply drain their dams or try to sell them. It will end their businesses.

Comments as to Specific Sections of the Proposed Rules

690-020-0022 (Definitions)

The definition of "Modification," appearing under (27) in the Rule should be changed because it does not reflect the Statute's statement about "Modification."

The definitions section of the Statute defines "modification" under "Construct." ORS 540.433 (1)(c) provides that "modifications to a dam"

> (A) Do not include modifying dam height, performing maintenance actions or removing a dam;
> (B) Have a potential impact on the safe functioning of the dam; and
> (C) Are to an extent that the modified dam structures no longer conform to the original design.

The definition in the Rules should conform. The attempt to restate confuses the definition.

690-020-0043 (Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit(s) of Flow through Conduits)

690-020-0043 2(b) presently states that "seepage collars may not be used in any dam." But the Section heading refer only to New Dams or Dams modified to increase height. Therefor the section 2(b) should be removed or changed to state:

> Seepage collars may not be used in any New Dams or where a dam is modified to increase its height.

690-020-0070 (New Dams or to Increase Dam Height: Submittals and Notification by the Engineer of Record)

(4) of the proposed Rule states that the Engineer of Record must submit the final Emergency Action Plan (EAP) prior to commencing construction. (4) should be removed as the Emergency Action Plan requirements stated in ORS 540.482 provide differently. The Statute states specifically that the dam owner, not anyone else, shall develop the emergency action plan and file it in three places. Moreover the EAP section requires that the owner of a high hazard rated dam "develop" the EAP. This is the duty of the owner, not an engineer. The Rule language conflicts with the Statute. The Rule language should be removed.[6]

---

[6] See also discussion under 690-020-0400 Emergency Action Plans (EAP), at pp. 10-14.

690-020-0100 Hazard Rating of Dams

(2) of 690-020-0100 defining the basis for a High Hazard Rating

Rule 690-020-0100 expands the definition of High Hazard provided by the definition in the Statute, ORS 540.443(5), beyond the definition that High Hazard means expectation of loss of life should a dam fail. WRD previously said it agreed, but that (2) only interpreted when loss of life would occur. This is not clear in 690-020-100 which does not include the definition of "High Hazard" nor state that the Rule is the Department's interpretation of when loss of life is expected to occur. A dam owner is confused. The statutory definition is not given nor the purpose of the Rule explained. (2) should be omitted.

WRD has also added language concerning water velocity and water of one foot depth in recreational and other areas downstream in its High Hazard definition. This is entirely new and does not anywhere relate to "High Hazard" as expectation of loss of life. This language should be deleted.

(6) of 690-020-100 concerning the requirements of a dam owner if it requests department explanation of Hazard Rating.

The Proposed Rule reads:

> (6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inundation analysis, in support of this request.

This is not in accord with the previously announced intention of the Department to work with the owner.

The Proposed Rule does not require that the Department explain its rating change. It does not require the Department to present the evidence; it only provides that the dam owner may ask the Department consider its rating, not do anything about it. And it provides no cooperative method for the Department and owner to discuss and resolve the situation. The Department has said that it will work with owners, but its proposed rule does not so indicate or require.

690-020-120 Dam Breach Inundation Analysis

This Section has been drastically changed from previous drafts. The previous drafts applied only to New Dams and Increases to Height. This new rule applies to all dams. The rule is also unclear. It should be deleted or revised to be clear **and** apply only to New Dams and Increases to Height of Dams.

690-020-140 Modifications of Dams

First, this Rule is confusing and in places not within the Statute. The Rule deals with Modifications of Dams, but does not provide the definition of "Modification" nor any reference to the definition in the statute, ORS 540.443(1)(c). One reading this Rule likely understands it applies to all changes in dams. This is simply outside the Statute. The reader is misled by the Rule and would be much better served by the Statute.

The definitions section of the Statute defines "modification" under "Construct." It provides that modifications to a dam:

> (A) Do not include modifying dam height, performing maintenance actions or removing a dam;
> (B) Have a potential impact on the safe functioning of the dam; and
> (C) Are to an extent that the modified dam structures no longer conform to the original design.

ORS 540.443(1)(c).

The inclusion of the word "and" in (1)(c) is important. It requires that all three conditions must be present to count as "modification:" namely (1) modification does not include modifying dam height, performing maintenance actions or removing a dam, (2) the modification must also have a potential impact on safe functioning of the dam and (3) the modification would cause the dam to no longer conform to the original design. The definition of the term modification is limited in the Statute. The Rules cannot apply beyond the Statute. The public and dam owner are better served by the words of the Statute than the misleading directives of the Rule.

Second, many of the provisions under 690-020-0100 (2), (3), (4), (5), and (6) are excluded from modifications by the Statute, ORS 540.443 (1)(c), as quoted above.

For instance (2)(a), 2(b), 2(d), and 2(f) of the rules are maintenance actions excluded by ORS 540.443 (1)(c)(A). (2)(c) and (2)(e) include actions that may be excluded by ORS 540.443 (1)(c)(C) if the actions conform to the original design.

The same applies (3), (4), (5), and (6) of the Proposed Rules. For instance (5) that states that the State Engineer will determine the design and submittal requirements for modifications is outside the Statute as it apparently applies to all changes as a reasonable reading of the Proposed Rule indicates. But the Statute limits covered modifications to the definition stated above.

The section 690-020-0140 should be removed from the Rules. The Dam owner and public are better served by the Statute than the confusing and overbroad Proposed Rule.

690-020-0160 Removal

The Statute added requirements for removal of a dam. ORS540.552. The Rules add requirements for removal of a dam and partial removal of a dam. The Statute never mentions

partial removal of a dam. Therefore, Proposed Rules for partial removal should be eliminated from the rules. This requires elimination of "partially" in proposed 690-020-160 (1), elimination of "partial" in 690-020-160 (3)(a), removal of 690-020-160 (3)(e).

690-020-0250 Maintenance of Dams

In the Rule draft before January 30, 2020, the rule was entitled, "Owner Responsibility to Maintain." Waldensee objected on grounds that the rule had no basis in the statute. The Statute includes a Maintenance Section ORS 540.467, but that Section does not resemble the requirements proposed by new rule 690-020-0250 nor require dam owner documentation. There is nothing in ORS 540.467 or HB 2085, in its entirety, with regard to the list and requirements for 690-020-0250. The rule is without any basis in statute. The Agency response was to change the title to "Maintenance of Dams." Upon discussion in the Rules Advisory Committee meeting on January 30, 2020, this matter was raised with the Agency and the Agency said it would look at the request. No changes were made and the Rule remains overbroad and without basis in the statute. 690-020-0250 should be removed.

690-020-0340 Potentially Unsafe or Unsafe Conditions

First, "Potentially Unsafe" and "Unsafe" are terms defined in ORS 540.443(7) and (9). Proposed Rule 690-020-00340 does not reflect the definitions stated at ORS 540.443(7) and (9). The list of potentially unsafe and unsafe conditions are limited to the Statutory definitions. The Rule does not include the Statute's definitions nor is the list related to the definition of potentially unsafe, "the dam cannot withstand an earthquake or extreme flooding and has a high risk of internal erosion," or unsafe, "it is probable that, a dam cannot be depended upon to retain or pass water as designed or operated and inability of the dam to retain or pass water or wastewater as designed or operated could result in dam failure."

The second sentence in 690-020-0340 (1) of the Rules should be omitted. The Statute does not require that the Department **must use** all remedies to address unsafe conditions. ORS 540.458 and ORS 540.461 lay forth detailed procedures and steps that the Department must follow. The second sentence in (1) ignores the details of the Statute that the Department must follow.

Second, ORS 540.458, ORS 540.461, and ORS 540.464 regarding Corrective Action for Unsafe and Potentially Unsafe Conditions are detailed and specific. This was the result of an amendment process directed by the Chair of the Natural Resources Committee in Winter and Spring 2019. The Rules concerning Corrective Action place more requirements on the owner than stated in the Statute, omit items that the Water Resources Department consider in looking at and making determination on plans for corrective action per the Statute, and are confusing where the Statute is clear.

For example (6), (7), and (8) of Proposed Rule 690-20-0340 misstate terms in the Statute, leave out provisions required by the Statute, and add provisions to the Statute. For instance Section (8) of 690-020-0340 provides that "[i]ssuance of a proposed final order does not preclude the

Department from pursuing any and all lawful remedies as **the Department may determine** are necessary to protect life, property or public infrastructure including but not limited seeking injunctive relief in the circuit court." This is a misstatement and overstatement of the requirements for applying for an injunction as detailed in ORS 540.473. The Statute limits application to when the Department has information that a person is violating a final order issued under ORS 540.461 or the Department concludes that a dam poses an imminent risk to life, property or public infrastructure. Then the Department may apply to a circuit court dependent are where the dam is located for an injunction. ORS 540.473 does not provide that the Department can pursue specific other means. The Rules are limited to the Statute and do not extend beyond it.

The Rules do not accord with the detailed procedure and terms in the Statute. These terms were a part of the legislatively directed amendment process. The Rules must state what is in the Statute. The public and dam owners are ill served by overbroad Rules. If the Proposed Rule remains, it must reflect the Statute. Otherwise, Proposed Rule 690-020-0340 should be removed.

Emergency Actions and Emergencies (690-020-0400, 690-020-410, and 690-020-0420)

These sections of the Proposed Rules all regard Emergency Actions and Emergencies applying to dam owners. The procedures were first stated in a 2017 statute that was included in ORS 540.479, ORS 540.482, and ORS 540.485.

The Proposed Rules include requirements that conflict with the 2019 Statute and give the Department powers not in the Statute. The Rules should be removed and the Statute repeated. The Statute is straightforward and informs dam owners of requirements placed on them. The Rules are complicated, misleading, and provide power to the Department and impose requirements on dam owners both of which do not exist in the Statute. The public and dam owners are better served by the Statute.

690-020-0400 Emergency Action Plans (EAP)

Sections (1), (2), and (3) of proposed Rule 690-020-0400 include requirements and provisions not in ORS 540.482, the section of HB 2850 regarding Emergency Action Plans and Emergencies.

690.020.0400 (1) states that the final EAP for new Dams or where Dam height is modified must be reviewed and approved by the State Engineer. This is contrary to Statute that specifically states the dam owner with a high hazard dam shall develop the EAP (ORS 540.482(1)). And the Statute states what the dam owner must include in the EAP ORS (540.482(2)). It also states that the owner file the plan with the Department (ORS 540.482(3)). The Statute does not require that the State Engineer review and approve the EAP. This requirement is without authority in the Statute and conflicts with the directive of the Statute. It should be removed.

Sections (2) and (3) of Rule 690.020.0400 direct that a draft EAP is required prior to completion of new Dam construction and that a final EAP must be submitted prior to filling a new reservoir

and must be reviewed and approved by the State Engineer. Again the Statute regarding EAP does not include such requirements. And they are in conflict with the plain meaning of the Statute that dam owners develop EAPs and that the dam owners include specific provisions within them. ORS 540.482.

With regard to the statutorily required contents of EAPs, (5)(d), (5)(e), and (5)(f), of Rule 690.020.0400 fail to accurately set forth the specific requirements of the Statute (ORS 540.482(d), (e), and (f)). And (5)(e) of the Proposed Rule adds requirements not in the Statute. The Statute specifically states that the dam owner include in the EAP "a map of dam failure inundation zones for varying conditions, including, but not limited to, dry weather conditions and high flood conditions". ORS 540.482(e). The Rule includes additional requirements not in the Statute, namely that these maps must use inundation analysis specified by the Department and that the Department may require "one inundation map if the dry weather and high flood flows are not substantially different and that the inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section." These requirements are outside the authority of the Department to impose, are not included in the specific requirements of the Statute for EAPS by dam owners, and are so expensive and incomprehensible that dam owners cannot comply with the Proposed Rule requirements.

Sections (6), (7), and (8) of the Rules do not reflect ORS 540.482 (3), ORS 540.482(4), and ORS 540.485 (1) and consistently misrepresent the Statute and impose requirements not found in the Statute. Moreover (8) of this Rule is repeated more accurately in another section of the Rules, 690-020-0420 Immediate Action to Prevent Dam Failure. Accordingly (8) of 690-020-0400 should be removed. It confuses dam owners to repeat requirements and to do so inaccurately as explained below. Section (6) and (7) should be revised to reflect the Statute or removed.

Regarding Emergency Action Plan, the public and dam owners would be better served by a recitation of or reference to the Statute than imposition of the overreaching, confusing, and misrepresentative statements of the Rule.

690-020-410 Emergency Actions for Significant Hazard Dams

The provisions of this Rule are repeated more accurately in the following Section of the Rules, 690-020-0420 Immediate Action to Prevent Dam Failure. Accordingly 690-020-0410 should be removed. It confuses dam owners to repeat requirements and sometimes do so inaccurately as explained below.

(1)(a) of Proposed Rule 690-.020.410 states that the dam owner shall "notify the local emergency services agency, the Department and Persons in areas where the potential for Dam Failure creates risk to life, property, or public infrastructure **by telephone or other methods that ensure immediate notification.**" The words in bold do not apply to "**Persons**" per the statute, ORS 540.485 (2) and, in fact, contradict the Statute. ORS 540.485 (2) states:

(2) If an actual or potential dam failure creates an imminent risk to life, property or public infrastructure, and no emergency plan exists for the dam, the dam owner shall immediately:

(a) Notify by telephone or other method that ensures immediate notification:

(A) If the dam has a significant hazard rating, the local emergency services agency for the county where the dam is located;

(B) The Water Resources Department; and

(C) **To the extent practicable, persons in areas where the potential for dam failure creates a risk to life, property or public infrastructure** [Emphasis added.]; and

(b) Take all practicable actions to prevent dam failure.

The words from the Statute that are bolded reflect that dam owners of dams without EAPs are required to take practicable steps to notify residents downstream. They are not required to notify them by telephone or methods that ensure immediate notification. The Rule again imposes requirements that are not in the Statute. A dam owner does not know all persons in the area and cannot reach them. That is why he contacts local emergency services. The Rule imposes an impossible burden that is not in the Statute.

The Statute is clearer than the Proposed Rule and the Proposed Rule does not follow the Statute. The dam owner is better served by reading the Statute, not the confusing Rule. The Rule should be removed.

690-020-0420 Immediate Action to Prevent Dam Failure

The Proposed Rule summary that the rule describes "Water Resources Department action in an emergency at a Dam rated High or Significant Hazard" is inaccurate. The Proposed Rule as written applies to Emergency Actions at Dams. The summary should be so revised.

Section (1), (2), and (3) repeat information given in 690-020-0400(8) and 690-020-0410. But the version in 690-020-0420 is more accurate and follows the Statute. Accordingly 690-020-0400 (8) and all of 690-020-0410 should be removed. Dealing with the same issue twice or more and in different ways makes the Proposed Rules confusing.

Significant Hazard Rated dams are not required to have Emergency Action Plans. The dam owner of a Significant Hazard Dam should be informed that he does not need at EAP. Without such an explanation the Rules may be interpreted to require otherwise.

(4) of the Propose Rule 690-020-0420 misstates the actual actions the Department may take and it misstates the sequencing of these actions. The Rules must accurately state the Statute. A comparison of the Statute and the Proposed Rule, with differences in the Rule indicated in italics and highlighted, reflect this:

ORS 540.485	Proposed Rule Provision
(3) If the department is aware of conditions that indicate the need for immediate action to	(4) If the Department is aware of conditions which indicate that

prevent dam failure, the department may advise the owner or operator of the dam or the individual in immediate charge of the dam regarding the actions necessary to prevent the dam failure.	immediate action is needed to prevent a Dam Failure, *it may take any immediate action to prevent failure of the Dam.* The Department may: (a) *immediately* contact the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure.

The Proposed Rule allows the Department to immediately take any action regarding the dam regardless of the guard rails in the Statute.

ORS 540.485	Rule Provision
(4) The department may communicate and coordinate actions necessary to reduce dam failure. If there is a rapidly increasing leakage or risk of overtopping at a dam that has a significant hazard or high hazard rating, the department may open gates or valves and may siphon or pump water to reduce the water level in the reservoir. …	(4)(c) *[Missing first sentence of Statute]* If the *Department observes that* there is a rapidly increasing *leakage or risk* of overtopping at a Dam that has a Significant or High Hazard rating, the Department may *perform any or all of the following actions*: (i)Open Gate or Valves and siphon or pump Water to reduce the Water levels in the reservoir; *(ii) Modify approval requirements for emergency construction work;* *(iii) Allow Modification of actions prescribed in an Emergency Action Plan; and* *(iv) Pursue any other lawful remedy.*

The Rules add provisions not included in the Statute and basically give the Department free reign to exceed the Statute in terms of actions and legal remedies. The Rules must be based on the Statute, not exceed it. This Proposed Rule is a violation of the due process requirements pertaining to property under the Fourteenth Amendment to the U.S. Constitution.

ORS 540.485	Rule Provision
(5) If a dam that has a significant hazard rating or high hazard rating presents an imminent risk of dam failure, the department or its agent or representative may enter without notice or permission upon any property that affords access to the dam to the extent entry is reasonable or necessary to allow evaluation of the condition or risk or to under undertake actions described in	(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, *it may take any immediate action to prevent failure of the Dam.* The Department may: (b) If a Dam has a Significant or High Hazard rating, [*omitted that this applies*

subsection (4) of this section.	*only to dams that "present an imminent risk of dam failure."]* the Department or its agents or representatives may enter *the property* without notice or permission *[omitted "upon any property that affords"] of the pertinent landowner to* access *to* the Dam and evaluate the condition or risk or to undertake necessary actions *[omission – described in section 4 of this section]*. The Department's entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary.

The Rule allows the Department to immediately take any action regarding the dam regardless of any guard rails in the Statute. The Statute also misstates what property the Department can enter without permission. And it fails to mention that the entrance is for only purposes indicated in Section 4 of the Statute.

The Statute is clearer than the Proposed Rule and the Proposed Rule expands beyond the Statute. The Proposed Rule should be removed and the exact provisions of the Statute inserted. Otherwise, the public and dam owners are misled.

690-020-0600 Civil Penalty Assessment for Dam Safety

Please see discussion under **The Costs and Civil Penalties imposed by the proposed Rules are Draconian and outside the Statute. The Rules should be amended to reflect the statutory requirements only**, pp. 3-5.

Respectfully submitted

by _____
Genice Rabe

for Waldensee LLC

WALDENSEE, LLC
4308 Orchard Heights Rd. N.W.
Salem, Oregon 97304

May 28, 2020

via e-mail to Breeze.K.Potter@oregon.gov
Breeze K Potter
Water Policy Analyst
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem OR 97301

via e-mail toRacquel.R.Rancier@oregon.gov
Rules Coordinator
Oregon Water Resources Department
725 summer Street NE, Suite A
Salem OR 97301

Dear Ms. Potter and Ms. Rancier:

Waldensee LLC sends this document to you per instructions from Ms. Rancier on May 27, 2020, and Keith Mills on May 28, 2020.

Waldensee LLC submits these comments in accord with the Notice of Proposed Rulemaking Including Statement of Need and Fiscal Impact, Chapter 690, Water Resources Department filed April 29, 2020. This letter concerns the Proposed Statement of Need and Fiscal and Economic Impact. It includes comments provided and filed on April 6, 2020, and some additional comments.

Introduction to Waldensee LLC Comments

The April 29, 2020, draft of the "Need for the Rule(s), Fiscal and Economic Impact" differs from previous drafts. Like the proposed "Need for the Rule(s), Fiscal and Economic Impact" published February 27, 2020, the April 29, 2020, document was not provided to the Rule Advisory Committee before its publication and distribution. Thus, the proposed final document "Need for the Rule(s) and Fiscal and Economic Impact" was not reviewed by the Rule Advisory Committee.

The parts of the Proposed Rules that are not based on the Statute or exceed it must be removed. The Legislature legislates, the Department cannot. These defects in the Proposed Rules were repeatedly raised and are raised here again.

A recent case provides that the Oregon Water Resources Department must follow the procedure provided in statute and that the Department does not have blanket authority to simply do what it likes. Order with Exhibits filed March 10, 2020, in *Brooks v. Byler et al.*, Marion County Circuit

Court Case No. 19CV27798. Rules exceeding the statute also violate due process rights protected under the Fourteenth Amendment to the U.S. Constitution. *Brooks v. Byler*.

Waldensee has no practical way to reproduce the April 29, 2020, PDF document to include comments and suggested changes, Waldensee therefore creates a document from the April 29, 2020, with its suggested changes and comments.

NEED FOR THE RULE(S)[1]

Dams provide a number of benefits such as controlling floods; capturing water for irrigation, municipal, recreation, fisheries; and other purposes. While dams provide a variety of benefits, failure of a dam can result in loss of life and damage to property and infrastructure. Oregon has adopted a dam safety program to ensure dams are designed and maintained to prevent failure. The Oregon Water Resources Department is the state agency charged with overseeing safety of dams across the state that are not regulated by a federal dam safety program and that are less than 10 feet in height or impound less than 3 million gallons of water or wastewater.[2]

In 2017, the Oregon legislature passed legislation regarding Emergency Action Plans and actions in Emergencies. In 2019, the Oregon legislature passed House Bill 2085 which included the 2017 statute regarding Emergency Action Plans and Emergencies as well as continuing many provisions of older statutes and increasing the provisions regulating dams.

Only dams that are 10 feet or more in height or store 3 million or more gallons (9.2 acre-feet) of water are subject to the Dam Safety Program requirement and subject to the proposed rules.[3]

Under the new and existing statutes, and under the proposed rules, Oregon's Dam Safety Program determines each dam's hazard rating based on the potential threat to life and property; sets construction, impoundment, removal and maintenance standards; conducts dam inspections for some categories of dams; and imposes fines. The 2019 statute also requires emergency action plans for dams rated High Hazard.[4] There are approximately 950 dams regulated by the Dam Safety Program. About 75 dams are rated as High Hazard, meaning loss of human life is expected should the dam totally fail, while approximately another 150 dams are rated as Significant Hazard, meaning failure is likely to result in damage to property or infrastructure. The other approximately 700 dams included in the Dam Safety Program are rated Low Hazard. These numbers change based on ongoing analysis and the creation of downstream risks created by others than dam owners.[5] The hazard rating is not a reflection of the condition of the dam, but rather reflects the potential impacts of total dam failure. A dam can be in good condition and

---

[1] Only the need for the rule is required to be stated. The Department's proposed language, however, provides history and facts that are not needed.
[2] ORS 540.446.
[3] ORS 540.446.
[4] Separated this sentence because the dam owner writes and files the Emergency Action Plan per the statute. The Oregon Water Resources Department has no role in these activities per the Statute.
[5] Dam owners cannot control the actions of others that create downstream risks.

still be assigned a high hazard rating. Well maintained dams, including dams rated High Hazard, have a low risk of failure.[6]

Chapter 390, Oregon Laws 2019, continued, repealed, and modified existing laws and instituted new provisions for dam construction and increasing the height of dams; impoundment; dam removal; coordination between the Department and dam owners; procedures regarding maintenance and corrective actions; imposed civil penalties; and other actions.

Chapter 390 also instituted provisions for the Oregon Water Resources Department to enhance the safety of dams and the protection of life, property and public infrastructure by working with federal, tribal, state, local, and private entities. Those provisions appear at ORS 540.488(3)(c). The Oregon Water Resources Department, like all public agencies and governmental entities, has a duty to protect its citizens in all ways possible. Prevention of risk of loss of life by the Department and all public entities is paramount. And the Department can coordinate with other entities to prevent loss of life under the 2019 statute, ORS 540.488(3)(c), by actions such as preventing building downstream of high hazard dams or the building of new dams in areas where that is expected to result in loss of life in the case of dam breach The Department needs to embrace this ability under this 2019 statute. But the Department has chosen not to do so. It has refused to draft or consider any rules applying ORS 540.488(3)(c).

Provisions of Chapter 390, Oregon Laws 2019 pertaining to dam safety are now codified in statute as ORS 540.443 to 540.491 and ORS 540.995. Dams under the regulation of a federal dam safety program and dams under 10 feet in height or that store less than 3 million gallons of water are not subject to these Proposed Rules. The new law requires rulemaking in order to implement certain provisions and also necessitates updates to existing dam safety rules to conform to the new law. As a result, the Department is conducting this rulemaking.

FISCAL AND ECONOMIC IMPACT[7]

The Statute imposes costs on dam owners. The Rules impose enormous additional costs on dam owners.

Dam owners face new fees for construction and increase in height of an existing dam. The new fees owners will pay the Department will range between $1750 to $8500 depending on the hazard level assigned to the dam. The rules impose other plan costs for construction and increase in height of a dam including engineering costs and various study costs, and labor and equipment costs.

---

[6] Sentence added as this was what the State Engineer for Water Resources told Rule Advisory Committee and it is important to reflect the difficult position in which responsible owners of High Hazard rated dams are placed. Even though they maintain their dams well, the Proposed Rules place enormous additional financial requirements on them.

[7] The language of the document filed April 29, 2020, has been removed because it largely fails to present the fiscal and economic effects of the rules on dam owners. This section purpose is to address fiscal and economic effects of the rules on dam owners. The Agency's proposed language is largely a justification for the proposed rules, it does not provide the requested information of fiscal and economic impact. The Agency's proposed language has been replaced with suggested language that reflects the fiscal and economic effect.

Dam owners must now apply to the Department to remove a dam. No requirements as to removal of a dam previously existed. Specific rules for removal application and removal are imposed. In one section of the Statute, the Department can require an engineer. The Proposed Rules, however, provide that the Department can require an engineer in most matters of removal. The Statute imposes new costs and the Rules impose additional costs on the dam owner where none existed previously.

The costs to dam owners regarding corrective actions and maintenance actions are also increased. According to the Department these include engineering fees for plans, oversight and reporting. They also require labor and equipment to be paid by dam owners. And they may require attorneys to review and advise on the legal requirements and to engage in representation of dam owners when the Department takes enforcement actions. The Rules also decree civil fines regarding enforcement on the dam owner. The fines in the Rules are much greater than the fines in the Statute. Civil fines imposed by the Statute are from up to $500 per month for maintenance actions and up to $2000 per occurrence for other actions for dams rated high hazard. The Department, in the proposed rules, states that these fines are per day or month. Thus fines that are $2,000 per day for owners of High Hazard rated dams can become $60,000 per month, $730,000 per year, to an infinite amount.

Emergency Action Plans (EAPS) are required from all High Hazard Dam Owners. The dam owner develope the EAPs by including the provisions listed in the Statute. These requirements for inclusion in the EAP, including notification, review, and other matters are detailed in the Statute. There are also actions required in emergencies including notification, pumping, engagement of engineers, and more actions that increase costs.

The Proposed Rules impose higher costs on all dam owners. These costs can range from small amounts for owners of Low Hazard Rated dams to huge amounts for owners of High Hazard Rated dams, regardless of the actions such owners have taken and continue to take to keep their dams well maintained. Some of new costs are so high that even dam owners who keep their dams in good condition will either drain them or seek to sell them. And new dams will likely not be built.

Cost of Compliance[8]

(1)Identify any state agencies, units of local government, and members of the public likely to be economically affected by the rule(s)

State agencies, cities, counties, special districts, individuals, and businesses who own dams or are proposing to build a new dam are subject to these rules if the dam is not under the jurisdiction of a federal dam safety program and the dam meets the height and volume thresholds for inclusion under the Statute. Owners of covered dams will incur costs under these proposed rules for annual fee payments; to construct, increase height, remove, repair, and maintain dams;

[8] (1), (2), and (3) of Cost of Compliance have been separated and separately dealt with here to specifically address each topic. The Department's proposed statement had them all combined.

create and comply with Emergency Action Plans; take Emergency Actions; and pay civil penalties.

In regard to publicly owned dams, there are an estimated 66 publicly owned dams rated as high or significant hazard. Of these, approximately 35 are owned by cities, 23 by special districts or public utilities, 5 by counties and 3 by state agencies. Nine of the 66 publicly owned dams have known vulnerabilities that render them unsafe or have known or suspected vulnerabilities that may render them potentially unsafe. All dam owners of high and significant risk rated dams, including these dam owners, have been informed of the condition of their dams. All these dam owners will incur costs, up to millions of dollars to comply with these Rules. One city with a population of approximately 11,000 people is facing costs estimated at about $70,000,000.00.[9] Over time, there may be additional dams found to be unsafe or potentially unsafe. The owners of these dams will also incur large costs under the Rules. The Rules also authorize enforcement actions and civil fines. Again, such actions and fines will result in costs and fines that can exceed hundreds of thousands of dollars. For example, the fines associated with new construction, increase in dam height, impoundment, and removal of high hazard rated dams are $2,000 per day, about $30,000 per month, and $730,000 per year.

Customers and patrons who rely on these public reservoirs for drinking water, irrigation, and other purposes will likely experience corresponding rate increases.

(2) Effect on Small Businesses: (a) Estimate the number and type of small businesses subject to the rule(s)

There are 161 high and significant hazard dams regulated under the dam safety program that are privately owned. Of the 161 high hazard and significant hazard privately owned dams, an estimated 105 are owned by small businesses mostly for farm and ranch use and other commercial purposes. The remaining 56 dams are owned by corporations, which are or may also be small businesses, for manufacturing, industrial, or power generation uses; by homeowner associations; and by individuals for water consumption, irrigation, water control, or farm or ranch use. All these entities including small businesses incur costs under these rules for annual fee payments; to construct, increase height, remove, repair, and maintain dams; create and comply with Emergency Action Plans; take Emergency Action; and pay civil penalties.[10]

(2) Effect on Small Businesses: (b) Describe the expected reporting, recordkeeping and administrative activities and cost required to comply with the rule(s)

Dam owners, including small businesses are required to notify the Department if the contact information changes or after completing a transfer of title on the dam. The owner is required to draft, complete, and file an emergency action plan with three public entities. The owner is required to observe, maintain, and report certain conditions of the dam. The owner is required to take emergency actions where required. The owner is required to pay fees ($100 for a Low Hazard rated dam, $200 for a Significant Hazard rated dam, and $670 for a High Hazard rated dam) and these fees rise over time. Dam owners seeking to build a dam or increase the height of

[9] The correct amount should be included if this amount is incorrect..

[10] Revised the paragraph to reflect the purposes of dams and list costs incurred under the rules.

their dam must pay applications fees expected by the Department to range from $1750 to $8500. Dam owners must keep records. All these requirements mean labor for administrative costs depending on the size of the dam of up to tens of thousands for administrative costs. These costs are only part of the costs to comply with the Rules. Other costs are discussed below and above.[11]

(2) Effect on Small Businesses: (c) Estimate the cost of professional services, equipment, supplies, labor and increased administration to comply with the rule(s)[12]

Dam owners, including small businesses, will incur costs to comply with the Proposed Rules for professional services, equipment, supplies, and labor in order to undertake actions related to construction, maintenance, repair, removal, development of emergency action plans, and taking emergency action. These costs include the engagement of the services of professional engineers, knowledgeable attorneys, and labor, particularly for high or significant hazard dams. These costs can range up to hundreds of thousands of dollars per dam.

Dam owners, including small businesses, must evaluate the conditions of the dam and make repairs and maintain the dam. The rules impose new requirements and penalties on dam owners regarding maintenance, Emergency Action Plans, emergency actions, and corrective actions. These Proposed Rules require more labor, administrative time and work, and equipment and, in turn additional cost for labor, administrative work, and equipment. Dam repairs are expensive and become more expensive under the Proposed Rule. This is particularly so for High and Significant Hazard rated dams. The repair expenses can exceed millions of dollars per dam

The Proposed Rules shorten the time for hearing regarding actions or remove it altogether in some instances. These changes are expensive for the dam owner as it must use engineers, buy or rent expensive equipment, and pay labor when these expenses may not be necessary. The Dam Owner must also hire attorneys with regard to the shortened or non-existent time for hearing or to oppose imposed Department actions that may not be necessary. In the end, the proposed rules impose costs on dam owners that may be unnecessary.

Under the proposed Rules, owners of high and significant hazard rated dams, including small businesses, that wish or need to remove a dam would need to have a removal plan reviewed and accepted by the Department. There are costs to develop the plan and interact with the Department. These include, most likely, engineering costs. They also include administrative costs and expenses. The Department estimates that the costs associated with developing a removal plan can be up to $30,000 for a high hazard rated dam.

Owners of high hazard rated dams, including small businesses, must complete emergency action plans under the Rules and possibly update them. The costs of creating a new emergency action plan include engineering costs to develop the plan and gather or create an inundation analysis. The cost of updating an emergency action plan likely requires engineering costs for the rewrite

---

[11] Revised the paragraph to include costs incurred by dam owners, including small businesses.

[12] The Department's language generally seeks to diminish costs. The Department says that it does not know the costs. Dam owners know the costs. The Department's language also frequently does not address the inquiry of 2(c). The here proposed language leaves out the Department's non-responsive and defensive languages. It directly addresses 2(c).

and a new inundation analysis if necessary. Knowledgeable attorneys are necessary to review and explain the rules and statute requirements and possibly write the new plan or updated plan. The professional costs and administrative costs of a new plan could range up to $50,000.[13]

In addition to the professional, labor, and administrative costs, to dam owners, including small businesses, the Proposed Rules impose civil penalties and shorter periods of time to respond to enforcement action. The civil penalties as explained above allow imposition of civil fines of from $500 to up to $2,000 per day for dams rated high hazard (about $30,000 per month, and $730,000 per year). These fines and the shorter time periods make knowledgeable attorneys a practically required expense.[14]

DESCRIBE HOW SMALL BUSINESSES WERE INVOLVED IN THE DEVELOPMENT OF THESE RULE(S)

The Rule Advisory Committee (RAC) included representatives of groups and entities that either are, or represent, small business dam owners, and also private engineers that work on dam design, rehabilitation and removal. These groups included individual entities that own dams, technical consultants and engineers, local governments, special districts, and the Oregon Farm Bureau. Although the Rule Advisory Committee was provided with earlier drafts of the Statement of Need and Fiscal Impact of the Proposed Rules, it was not provided with the February 27, 2020, and April 29, 2020, documents until they were published and after Rule Advisory Committee meetings had ended. The last RAC meeting occurred on January 30, 2020. The February 27, 2020, and April 29, 2020, documents include extensive changes drafted by the Department. The RAC had no opportunity to review and weigh in on the proposed February 27, 2020, and April 29, 2020, Statements of Need and Fiscal Impact. The Department refined its notice in an attempt to address some comments of one RAC member after the RAC meetings ended. Nevertheless, the Rule Advisory Committee had no opportunity to review and weigh in on the proposed Statements of Need and Fiscal Impact published on February 27, 2020, and April 29, 2020, until after publication.

[13] The reference to significant hazard dams in the Agency's proposed language was removed as the requirement for an EAP applies only to High Hazard rated dams.

[14] The short or non-existent time periods for the dam owner to respond to enforcement actions and the amount of the civil penalties, particularly as interpreted by the Proposed Rules and other provisions violate the due process clause of the Fourteenth Amendment of the U.S. Constitution. *See, Brooks v. Bylar.*

WAS AN ADMINISTRATIVE RULE ADVISORY COMMITTEE CONSULTED?

Yes, but see the statement above as to the inability of the Rule Advisory Committee to comment after the extensively revised Statements of Need and Fiscal Impact were published on February 27, 2020 and April 29, 2020.

Respectfully submitted

by _____
Genice Rabe

for Waldensee LLC

Oregon

May 29, 2020

Racquel Rancier
Rules Coordinator
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem, OR 97301

Sent via email to racquel.r.rancier@oregon.gov

Re: Rulemaking for OAR CHAPTER 690: Oregon Water Resources Department - Safety of Dams: Rules for Design, Construction, Maintenance, Corrective Action, Removal, and Emergencies

Dear Ms. Rancier:

The Oregon Department of Environmental Quality (DEQ) respectively submits the following comments on the above rulemaking. In preparing these comments, we understand that the primary focus of the rulemaking is alignment with ORS 540.443 to 540.491 and 540.995.

General comments

Overall, DEQ supports the Department's proposed rule revisions. We understand that the proposed revisions are developed to align rules with revised statutes that provide necessary authority to the OWRD in implementing the Oregon Dam Safety Program.

These rules provide needed clarity to dam owners and operators, state and local officials (including emergency managers), Tribal governments and the public. DEQ strongly supports aspects of the revised rules that provide the OWRD with the authority needed for a comprehensive regulatory program of oversight of dam construction, modification, maintenance, repair, and emergency actions. Gaps in the existing rules, including OWRD's compliance and enforcement authority, potentially place public safety, water quality and aquatic resources at risk.

Aspects of Rules for which DEQ recommends that OWRD consider additional clarification

Comment #1: Protection of natural resources

The proposed rule does not explicitly address protection of water resources and water quality during activities covered by the rule, including designated beneficial uses like aquatic life and drinking water protection. It is in the public interest to protect those resources and uses during activities associated with dam construction, modification, maintenance, repair, and emergency actions. Therefore, DEQ encourages OWRD to consider clarification for the following aspects of the rulemaking:

OAR 690-020-0024(3) Intergovernmental & Inter-agency coordination: Depending on the specific circumstances, one or more of the primary aspects of the rulemaking pertaining to Construction, Maintenance, Corrective Action, Removal, and Emergencies for any given dam potentially could trigger additional federal, state or local regulatory responsibilities. One approach to address this clarification would be to include an omnibus statement in OAR 690-020-0024 analogous to the following:

For activities associated with triggering events or conditions in these rules, dam owners and operators may have additional responsibilities in addition to OWRD dam safety rules. Nothing in these rules exempt dam owners and operators from complying with state and federal laws and regulations.

Comment #2

Similar to the above, but in a manner that provides enhanced direction toward other applicable laws and regulations, we suggest considering the inclusion of additional consultation requirement language comparable to that which is required under OWRD rules administered under OAR 690-051-0060.

Comment #3

DEQ encourages OWRD to consider including specific clarification for the following technical content of the rulemaking:

690-020-0042 Minimum Design Requirements for New Dams or to Increase Dam Height: Spillways

…(i) Energy dissipation. The design of stilling basins for high hazard dams, and where required by the State Engineer for significant hazard dams, shall be based on calculated hydraulic forces and designed to dissipate energy from the inflow design flood, ***minimize scour and erosion, and minimize gas entrainment***.

In addition, minimizing gas entrainment should be part of the spillway design.

If you have questions, or would like more information, please contact Rian vanden Hooff, Senior Policy Analyst, at 503-229-5988.

Sincerely,

Justin Green
Water Quality Administrator

WATERWATCH

May 29, 2020

Racquel Rancier
Rules Coordinator
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301
racquel.r.rancier@oregon.gov

Re: Comments on Rulemaking Related to Safety of Dams including Design, Construction, Maintenance, Corrective Action, Removal, and Emergencies

Dear Ms. Rancier,

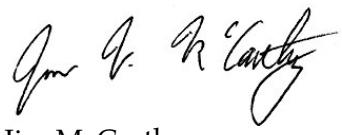
WaterWatch of Oregon submits these comments to express our general support for the changes to dam safety rules as proposed by the Oregon Water Resources Department. We believe these proposed changes represent modest but essential improvements in the Department's ability to carry out its critical responsibility to oversee the safety of Oregon dams not regulated by federal authorities.

The safety of dams is important for the personal safety for our members, as well as all Oregonians who spend time enjoying and recreating on our state's spectacular rivers and streams. WaterWatch membership includes many river-dependent small businesses such as fishing guides, outfitters – all are greatly impacted by dam safety. Although invaluable natural resources such as fisheries and water quality are not generally considered the kind of "infrastructure" that is specifically protected against damage by these new proposed rules, we know this natural infrastructure is also protected by improved prevention of dam failure, along with the economic systems dependent on these resources.

Recent dam failures and disasters in California and Michigan underscore the need to improve Oregon's ability to require repairs and emergency preparedness at our designated High and Significant Hazard rated dams. Specific to this goal, we would like to express our support for the proposed changes to civil penalties under these new rules. These changes provide the Department with essential tools to encourage owners of High or Significant Hazard dams to make needed safety repairs, generate Emergency Action Plans, as well as to require other important actions protective of public safety. In fact, we would like these civil penalties made stronger to provide greater encouragement for these critical actions. In our work over decades for Oregon rivers, we have unfortunately come across too many dams in disrepair or lacking useful emergency plans. This problem is only getting worse with time. We believe these new tools will help the Department better address this important issue impacting every corner of the state.

Conclusion: For the aforementioned reasons, WaterWatch of Oregon supports issuance of the new rules as proposed.

Sincerely,



Jim McCarthy
Southern Oregon Program Director
WaterWatch of Oregon
P.O. Box 261
Ashland, OR 97520
jim@waterwatch.org

Department Response to Public Comments

This document contains high level summaries of comments and edits to the rules. See Attachment 5 containing the full comments and Attachment 8 for all Department edits to the rules (both in response to comments and due to final review by Department staff).

Public Comment #1 – Oregon Water Resources Congress & Oregon Farm Bureau

Comment Summary:

The Department should adhere to "its representations made on implementation described during the RAC process." The Department should prioritize education over enforcement during initial implementation and ensure flexibility on implementation to accommodate unforeseen circumstances. The Department should provide periodic updates on implementation, "at a minimum providing annual reports to the Water Resources Commission in the first years of the program...." The Department should provide dam operators with an opportunity to provide formal feedback and should review rules and processes regularly.

> Department Response: The comment offers recommendations for implementation of the proposed rules. The Department agrees that the Department's priority is education and moving towards voluntary compliance. In addition, the Department agrees that it will need to periodically assess the rules and how they are being implemented. No changes to the proposed rules were made as a result of this comment.

Public Comment #2 – ACEC Oregon (American Council of Engineering Companies of Oregon)

Comment Summary:

The proposed rules place responsibility for dam construction on the Engineer of Record. Specifically, 690-020-0065(1)(c) "adds a major new responsibility" to the profession that is currently not a customary function of services.

> Department Response: The Department has made the following changes to 690-020-0065(1)(c): "A provision stating that the Engineer of Record ~~is responsible for the construction of the Dam~~ will observe the Dam during construction as needed to determine if construction is consistent with the approved design and construction documents. This provision shall also include a description of how the Engineer of Record will determine if construction work in progress fails to conform to the approved plans and specifications, and that such non-conforming work will be corrected; ~~should describe periodic inspections to evaluate whether the construction is proceeding in accordance with the approved plans and specifications and describe how the Engineer of Record will take actions to prevent defects and deficiencies in the construction of the Dam and require work identified that fails to conform to the specifications to be corrected~~."

Public Comment #3 – Waldensee, LLC

This section contains high level summaries of comments and edits to the rules; see attachment 5 containing the full comments and attachment 8 for Department edits to the rules.

Comment Summary (General Comments):

The proposed rules misstate the statute's requirements, exceed the scope of the statute, and do not include all of the statute's requirements. A recent case, *Brooks v. Byler*, provides that the Department must follow the procedures provided in statute and does not have blanket authority to do what it likes. According to the court decision, rules exceeding the statute also violate due process rights protected under the Fourteenth Amendment of the U.S. Constitution. The cost of building and maintaining a dam under the proposed rules is "draconian and unaffordable." The Department has the authority under ORS 540.488(3)(c) to coordinate with federal, tribal, state, local, and private entities to enhance dam safety and protect life, property, and public infrastructure in areas below dams. The Department should include provisions in the proposed rules that address the responsibility of the Department and other public entities to protect life, property, and public infrastructure, in particular, by limiting the ability of individuals to build houses in inundation areas.

> Department Response (General Comments): The *Brooks v. Byler* decision involves an analysis specifically related to the rules and authorities governing groundwater use in a particular geographic region and does not review or consider the Department's authorities related to regulation and administration of Oregon's Dam Safety Program. Under ORS 536.027, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Department and Commission. In addition, per ORS 540.488, the Commission has the authority to adopt rules that are "necessary or convenient for the administration and enforcement of ORS 540.443 to 540.491."
>
> Improving safety at dams and implementing actions in an emergency, serve to protect people and property below dams and are within the Department's jurisdiction. The Department does not have authority to limit development below dams. Local planning entities are responsible for developing land use plans and making land use decisions. The Department has proposed rules for coordination consistent with staffing and technical expertise.
>
> While some new or additional costs to the Dam owner may result from these proposed rules, the rules are necessary for the administration and enforcement of ORS 540.443 to 540.491 and help to protect public safety through the safety dams.

Comment on Notice and Statement of Need and Fiscal Impact: Waldensee, LLC also submitted comments on the Notice of Proposed Rulemaking and Statement of Need and Fiscal Impact. See attachment 5 containing the full comments.

> Department Response: The Department has made several attempts to address the concerns submitted by Waldensee throughout the rulemaking process. Other members of the Rules Advisory Committee did not identify concerns with the statement. A fter the Rules Advisory Committee met, the Department made several additional attempts to make changes to address Waldensee's concerns as the Department determined to be appropriate.

The Department believes that the Notice provides sufficient information to inform the public and businesses of the economic impact of the proposed rules with sufficient detail to allow them to determine the likely fiscal impact on them.

Comment Summary for 690-020-0022(27): The definition of "Modification," appearing under subsection (27) in the rule should be changed because it does not reflect the statute.

Department Response: While "modifications to a dam" are mentioned within the definition for "Construct", the term modification is not itself a defined term in statute (ORS 540.443). While the definition of "Modification" in the proposed rules is consistent with the elements mentioned in the definition of "Construct" in ORS 540.443(1)(c), the Department has made changes to the proposed rules to more closely mirror the statute at the commenter's request.

Comment Summary for 690-020-0043(2)(b): The rule states that "seepage collars may not be used in any dam." The section is supposed to apply only to new dams or dams modified to increase height.

Department Response: The Department has made the following changes to 690-020-0043(2)(b): "Seepage collars may not be used; ~~in any Dam.~~"

Comment Summary for 690-020-0070(4): The rule states that the Engineer of Record must submit the final Emergency Action Plan (EAP) prior to commencing construction. This subsection should be removed as the Emergency Action Plan requirements stated in ORS 540.482 provide differently.

Department Response: ORS 540.482 requires a "dam owner" to submit an Emergency Action Plan. As a result of this comment, the Department has amended subsection (4) to say, "…the Dam owner, or Engineer of Record on behalf of the Dam owner…." This provision applies only to new dams, not existing dams. In addition, the Department has previously and continues to include Emergency Actions Plans as part of the "plans" regarding the "operation" of the dam that the Department may require and approve when constructing a new dam pursuant to ORS 540.449.

Comment Summary for 690-020-0100(2) and (6): Subsection (2) expands the definition of High Hazard provided ORS 540.443(5), beyond the definition that High Hazard means expectation of loss of life should a dam fail. Specifically, the proposed rules contain additional language concerning water velocity and water of one foot depth in recreational and other areas downstream. Subsection (6) does not require the Department to explain a rating change or present evidence. This subsection allows the dam owner to ask the Department to consider its rating but does not provide a cooperative method for the Department and owner to discuss and resolve the situation.

Department Response: The definition of "High hazard rating" in statute (ORS 540.443) depends upon the Department's finding that a loss of human life is expected to occur if a dam fails. In order to make the determination that loss of human life is expected, the Department must set out a method of analysis. Subsection (2) explains how the Department will determine if loss of human life is expected to occur when a dam fails. The criteria utilized in subsections (2)(a)–(b) are nationally accepted standards of practice. The Department will use the best available information to make such determinations.

Subsection (6) provides a mechanism for a dam owner to request that the Department reconsider a hazard rating and allows a dam owner to provide supporting documentation from an engineer of their choice in support of the request. As a result of this comment, the Department has made changes to the proposed rules clarifying the analysis is for probable loss of life, and also specifying that the owner may "obtain records" from the Department of its analysis. Furthermore, the existing proposed rules specify the owner may request to meet with the Department.

Comment Summary for 690-020-0120: Previous drafts of this section only applied to New Dams and Increases to Height. This new rule applies to all dams. The rule is unclear and should be deleted or revised to apply only to New Dams and Increases to Height of Dams.

Department Response: The Department agrees that the rule was unclear. The Department has added the following language to the proposed rule, "A Dam breach inundation analysis will be conducted as specified in this section to determine or revise the Hazard Rating of a Dam." The Department removed references related to submittal by the Engineer of Record, revising the subsection (4) to say, "A report summarizing the model information and results must be stamped by the Engineer." This rule is intended to identify the method used by the Engineer of Record and also used by the Department. For example, if the Department does an analysis to revise an existing dam's rating.

Comment Summary for 690-020-0140: The rule is confusing and overbroad. The rule does not provide the definition of "Modification" nor any reference to the definition in the statute. The rule seems to apply to all changes in dams, which is outside the scope of the statute. Many of the provisions under 690-020-0100(2)–(6) are excluded from modifications by the statute. This section should be removed from the proposed rules.

Department Response: While "modifications to a dam" are mentioned within the definition for "Construct", the term modification is not itself a defined term in statute (ORS 540.443), the statute does outline parameters for what can be considered "modification" within the definition of construct. The definition of "Modification" in the proposed rules is consistent with the elements mentioned in the definition of "Construct." In order to make it clear that a defined term is referenced, the Department has updated instances of the word "modification" to read "Modification" and changed the phrase "Modify a Dam" in subsection (1) to read "make Modifications to a Dam" instead. In response to this comment, the Department has made changes to the language in subsections (2)–(3) in order to more closely align with the statute.

Comment Summary for 690-020-0160: The statute does not mention partial removal of a dam. Any mention of "partial" should be removed from the rule.

Department Response: Under ORS 536.027 and ORS 540.488, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Commission and for the administration and enforcement of ORS 540.443 to 540.491. Furthermore, ORS 540.588 requires, at a minimum, the Commission to establish in rule "Standards for the site, plans, specifications, designs and other engineering requirements for the construction or removal of a dam." Identifying what constitutes removal is necessary for implementation and enforcement of the statute, specifically ORS 540.452.

Removal of dam generally involves making it so that can no longer permanently store water—this typically involves partially to wholly demolishing the dam. The Department has provided a definition for "Removal" in 690-020-0022, and removed reference in 690-020-0160 to "partial."

Comment Summary for 690-020-0250: The rule is overbroad and without basis in statute and should be removed.

Department Response: Under ORS 536.027 and ORS 540.488, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Commission and for the administration and enforcement of ORS 540.443 to 540.491. ORS 540.479(2) provides that the "The dam owner shall review and evaluate the conditions at the dam as necessary to: (a) Keep the dam in good repair and properly maintained; and (b) Address any detected conditions that may pose a risk of dam failure." ORS 540.455 authorizes the Department to make inspections of dams regarding their maintenance and to identify specific maintenance actions. ORS 540.467 authorizes the Department to require an owner to undertake maintenance actions that have been left unaddressed. As such, the Department believes that rules outlining maintenance actions that an owner should undertake are appropriate. No changes to the proposed rules were made as a result of this comment.

Comment Summary for 690-020-0340: The rule does not reflect the statutory definitions for "potentially unsafe" and "unsafe" conditions. The second sentence in subsection (1) should be omitted because it does not reflect the detailed list of steps and procedures the Department must follow according to the statute. The rules concerning corrective actions place more requirements on the dam owner than stated in the statute, omit items the Department should consider in looking at and making determinations on plans for corrective action per the statute, and are confusing. Subsections (6)–(8) misstate statutory terms, leave out provisions required by the statute, and add provisions to the statute.

Department Response: Under ORS 536.027 and ORS 540.488, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Commission and for the administration and enforcement of ORS 540.443 to 540.491. Subsection 1 was removed. In order to make it clear that defined terms are referenced, the Department has updated instances of the words "unsafe" and "potentially unsafe" to read "Unsafe" and "Potentially Unsafe." The conditions outlined in the proposed rules specify example conditions that would lead the Department to determine that a dam meets the definitions of unsafe or potentially unsafe. The Department modified the proposed rules to make that clear. The Department also made modifications to the proposed rules to more closely align them with the statute.

Comment Summary for 690-020-0400: The rule includes requirements that conflict with the statute and give the Department powers which are not in statute. Subsections (1)–(3) include requirements and provisions which are not in statute. Subsection (5) includes requirements that are not in the statute, impose expenses on dam owners, and are "incomprehensible." Subsections (6)–(8) misrepresent the statute. Subsection (8) is better stated in 690-020-0420 and should be removed.

Department Response: Under ORS 536.027 and ORS 540.488, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Commission and for the administration and enforcement of ORS 540.443 to 540.491. ORS 540.482(1) requires emergency action plans to be submitted. The rules specify when the plans must be submitted, which is necessary for the implementation and enforcement of this statute. In addition, the Department has previously and continues to include Emergency Actions Plans as part of the "plans" regarding the "operation" of the dam that the Department may require and approve when constructing a new dam pursuant to ORS 540.449. The Department has made modifications this section in order to make the connection with ORS 540.449 clearer. In regards to subsection (5), nearly all of the requirements mirror the statute, and additions merely clarify the requirements. Other changes to this section were based on Department staff review of the proposed rules.

Comment Summary for 690-020-0410: The rule includes requirements that conflict with the statute and give the Department powers which are not in the statute. Subsection (1)(a) contradicts the statute and imposes requirements that are not in the statute. A dam owner does not know all persons in the area and cannot reach them all. The rule imposes "an impossible burden" that is not in statute. This rule is confusing and should be removed.

Department Response: The Department has removed section 690-020-0410 from the proposed rules. See Department Response for 690-020-0420 below for additional details.

Comment Summary for 690-020-0420: The proposed rule summary is inaccurate. The rule includes requirements that conflict with the statute and give the Department powers which are not in the statute. The rule summary should be revised to reflect "Emergency Actions at Dams." Subsections (1)–(3) repeat information from 690-020-0400(8) and 690-020-0410, but these subsections are more accurate. Therefore, the corresponding sections of 690-020-0400(8) and 690-020-0410 should be removed in order to increase clarity. Significant Hazard Dams do not require EAPs, and the rule should make this clear. Subsection (4) misstates the actions the Department may take and misstates the sequence of these actions. The rule misstates the Department's authority to enter property and does not indicate such entrance is only for the purposes indicated in subsection (4) of the statute. The rule should be removed and the language form the statute inserted instead.

Department Response: The rule summary for the proposed rules is not part of the final rules (OARs) and is included in the Notice of Proposed Rulemaking for informational purposes. The Department agrees with most of the comments. The Department has removed section 690-020-0400(8) and 690-020-0410 and amended 690-020-0420 to provide further clarification. The Department further modified the proposed rules to more closely align with statute.

Comment Summary for 690-020-0600: The amount of civil penalties in the rules are not supported by statute and are "astronomical" and "draconian." The civil penalties outlined in the proposed rules could result in penalties up to $730,000 per year. S ee full comments.

Department Response: Under ORS 536.027 and ORS 540.488, the Oregon Water Resources Commission is authorized to adopt rules and standards to perform the functions vested by law in the Commission and for the administration and enforcement of ORS 540.443 to 540.491.

ORS 540.488 requires the Commission to adopt rules that set a schedule of civil penalty amounts and conditions under which the Department may remit a civil penalty. The Department made further refinements to more closely align the proposed rules with statute. The commenter seems concerned that civil penalties will be used frequently and for any maintenance issue, even in instances where the owner has a history of taking action to address dam issues. As such, the Department added that it may "remit all or a portion of a civil penalty, considering the Dam owner's efforts to comply." The Department does not intend to use civil penalties frequently (as shown in its other programs)—we strive for voluntary compliance. However, it is important to balance the dam owner's concerns with the public safety issues that can be posed by dams, particularly those that are not properly designed or maintained. As such, civil penalties may be necessary in some instances in order to ensure public safety. Finally, it is not the Department's intent to issue a penalty of $730,000 - that is the maximum and assumes that an owner of a dam does not take action (for example, for failure to submit final as-built documents before impounding, civil penalties would stop accruing if a dam stopped impounding water even if the Department did not receive the documents). The key is to address the safety issues. Similarly, it is unlikely that construction work to remove a dam will take a year—the civil penalties only accrue while the work is being done without following the requirements for a removal plan.

(Written) Public Comment #4 – LWV (League of Women Voters of Oregon)

Comment Summary:

The government is responsible for evaluating dams and taking action to address dam safety issues. It is time to update and expand the Department's dam safety rules and the LWV of Oregon asks the Oregon Water Resources Commission to adopt the proposed rules.

Department Response: The comment is supportive of the proposed rules. No changes to the proposed rules were made as a result of this comment.

(Written) Public Comment #5 – Washington County Emergency Management

Comment Summary:

The sections 690-020-0100 and 0120 should come after the sections on Modification of Dams and Dam Removal and before the section on Maintenance of Dams. The titles of 690-020-0035, 0042, 0048, 0070, 0080, and 0160 should be changed for consistency with other section titles. The term "certain level" in 690-020-0068(3)(g) should be defined or explained within the section. Subsection (3) of 690-020-0250 requires additional clarification. Subsections (1)–(3) of 690-020-0400 are confusing. The terms "emergency level" and "level of emergency" in 690-020-0400(5) should be defined or explained within the section. Section 690-020-0410 could be removed as the same information is covered in 690-020-0420. If the Department can also impose civil penalties for other modifications of a Dam, such as changing the height, the Department should clarify in 690-020-0600(1)–(2). Additionally, subsections 690-020-0600(6)(a)–(d) should use the same language relating to continuing violations.

In addition, edits to grammar, punctuation, and/or capitalization are suggested for the following sections: 690-020-0068; 0080; 0100; 0140; 0160; 0250; 0260; 0310; 0340; 0400; 0410; 0420; 0460; 0600.

Department Response: The titles and order of sections within these proposed rules have been carefully considered. The Department has declined to make any changes to the ordering of sections or section titles in the proposed rules as a result of this comment. As a result of this comment, the Department has replaced "certain level" in 690-020-0068(3)(g) with the phrase: "the maximum safe operating level established by the Engineer of Record." As a result of this comment, the Department has amended 690-020-0250(3) to improve clarity: "Records necessary to track the conditions of the Dam should be maintained. ~~Maintain records as needed to track conditions on the dam.~~" The Department has removed section 690-020-0410 and amended 690-020-0420 to provide further clarification. Section 690-020-0600 was clarified to address comments. In order to increase clarity and consistency, the Department has changed the last sentence of subsections 690-020-0600(6)(a)–(d) so all sentences mirror one another.

The Department has made grammatical, punctuation, and/or capitalization changes to the following sections of the proposed rules as a result of this comment: 690-020-0068; 0100; 0140; 0160; 0250; 0260; 0310; 0340; 0400; 0420; 0460; 0600.

(Written) Public Comment #6 – Waldensee, LLC

Please refer to the Comment Summaries and Department Responses to (Written) Public Comment #3.

(Written) Public Comment #7 – Oregon Department of Environmental Quality (DEQ)

Comment Summary:

Overall, the DEQ supports the proposed rule revisions. The DEQ strongly supports those portions of the rules that provide the Department with authority necessary for "a comprehensive regulatory program of oversight of dam construction, modification, maintenance, repair, and emergency actions." The proposed rules do not explicitly address protection of water resources and water quality during activities covered by the rule. One or more of the activities related to construction maintenance, corrective action, removal, or emergencies could trigger additional federal, state, or local responsibilities which could be addressed by including an omnibus statement in 690-020-0024(3). Consultation language similar to 690-051-0060 should also be added to the proposed rules in order to ensure enhanced direction toward other applicable laws and regulations. The following language should be added to 690-020-0042(i): "...minimize scour and erosion, and minimize gas entrainment."

Department Response: The Department has determined those portions of the comment relating to inclusion of consultation and agency coordination language are best addressed through the water right permit process and are beyond the scope of this rulemaking. Advisory information is best suited in guidance documents, and the Department is currently coordinating with other natural resources agencies to determine the best approach to providing notice of natural resource protection requirements at dams.

The Department has made the following changes to 690-020-0429(2)(i): "…The design of stilling basins for High Hazard Dams, and where required by the State Engineer for Significant Hazard Dams, shall be based on calculated hydraulic forces and designed to dissipate energy and minimize scour and erosion from the Inflow Design Flood." No further changes to the proposed rules were made as a result of this comment.

(Written) Public Comment #8 – WaterWatch of Oregon

Comment Summary:

WaterWatch of Oregon is generally supportive of the proposed rules. WaterWatch of Oregon believes the proposed rules "…represent modest but essential improvements in the Department's ability to carry out its critical responsibility to oversee the safety of Oregon dams not regulated by federal authorities." Specifically, WaterWatch of Oregon is supportive of the civil penalties contained in these proposed rules and would like "these civil penalties made stronger." WaterWatch supports adoption of the new rules as proposed.

Department Response: The comment is supportive of the proposed rules. No changes to the proposed rules were made as a result of this comment.

CHAPTER 690
DIVISION 20
Dam Safety

690-020-0000
Purpose and Applicability
(1) The purpose of these Division 20 rules is to implement ORS 540.443~~537.400(4) and ORS 540.350~~ through 491 and ORS 540.995~~390~~ with actions that are intended to ensure the safety of the ~~d~~Dams, insofar as ~~d~~Dams may affect possible loss of~~damage to~~ life or property, and damage to public infrastructure. Prioritization of Dam safety actions and requirements are based on the Hazard Rating of the Dam. These rules outline processes to:~~. The Department is authorized to review design and specifications for dam construction and modification, to conduct routine inspections, and to take enforcement actions on dams that do not ensure the safety of life and property.~~
(a) Review design and specifications to Construct a Dam;
(b) Review plans for removal of Significant Hazard and High Hazard Dams;
(c) Conduct routine inspections and notify Dam owners of outcomes;
(d) Cooperate with Dam owners over Dam safety issues;
(e) Prescribe Maintenance Actions, corrective actions, or any other actions necessary to protect life, property, or public infrastructure consistent with the Department's authorities and with law, and to pursue formal enforcement as necessary;
(f) Communicate, coordinate, and collaborate with Persons, Tribes, or other government entities regarding Dam safety; and
(g) Plan for and respond to emergencies as necessary and as consistent with law.
~~(2) These rules apply to dams that are subject to ORS 540.350 through 540.390 and which exceed the height and storage limits described in ORS 540.400.~~
(2~~3~~) These rules do not apply to:
(a) Dams that are less than ten feet in Height ~~high~~ or that impound~~store~~ less than three~~3~~ million gallons (9.2 ~~a~~Acre~~-~~ feet);~~, except for general guidance and permit requirements described in OAR 690-020-0029; or~~
(b) Water storage ~~t~~Tanks or various types of ~~t~~Tanks that are part of ~~w~~Water treatment facilities; and~~.~~
(c) Dams regulated under a federal Dam safety program, except as provided in ORS 540.446 and OAR 690-020-0024.
(3~~4~~) Compliance with ORS 540.443 through 491 and these OAR Division 20 rules does not relieve the owner or operator of a Dam or an individual in immediate charge of a Dam from any duty, obligation, or liability regarding the ownership, maintenance, or operation of the Dam. ~~The dam safety fee authorized by ORS 536.050(2) shall be used to support the dam safety program as described in OAR 690-020-0200.~~
~~(5) The State Engineer may delegate dam safety duties to a dam safety engineer working for the Department for the purposes of ORS 540.350 through 540.390.~~
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400 & 536.050~~
Statutes/Other Implemented: ORS 540.446, 540.488, 540.491~~183, 540 & 536~~
History:

WRD 2-2015, f. & cert. ef. 3-17-15
Renumbered from 690-020-0021, WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10
WRD 12-1994, f. & cert. ef. 11-7-94
WRD 12-1986, f. & ef. 10-3-86

690-020-0022
Definitions
Unless the context requires otherwise, the following definitions apply in OAR Chapter 690, ~~d~~Division 20:
(1) "Abutment" means a natural valley or canyon side against which the ~~d~~Dam is built;
(2) "Acre-~~foo~~Feet" means the unit of ~~equivalent~~ volume equal to ~~of~~ one acre covered with one foot of ~~w~~Water (325,900 gallons);
(3) "Annual Exceedance Probability Flood" means the likelihood of a specific flood flow being equaled to or exceeded in any given year at that specific location, expressed as a percentage;
(4) "As-built ~~d~~Drawing" means an engineering drawing of a ~~d~~Dam as it was actually constructed, noting all differences between original design and actual constructed condition;
(5) "Conduit" means a closed conveyance used to release ~~w~~Water through a ~~d~~Dam;
(6) "Core" means a soil of low permeability within an ~~e~~Embankment ~~d~~Dam;
(7) "Construct" has the meaning given to the term in ORS 540.443;
(8~~7~~) "Cutoff Trench" means a trench excavated beneath the ~~d~~Dam ~~f~~Foundation and backfilled with low permeability material to retard ~~w~~Water seepage;
(9~~8~~) "Dam" has the meaning given to the term in ORS 540.443~~means a hydraulic structure built above the natural ground grade line that is used to impound water. Dams include all appurtenant structures, and together are sometimes referred to as "the works." Dams include wastewater lagoons and other hydraulic structures that store water, attenuate floods, and divert water into canals~~;
(10~~9~~) "~~Dam~~ Crest" means the top of the ~~d~~Dam;
(11~~0~~) "~~Dam~~ Height" means the maximum ~~h~~Height of the ~~d~~Dam above natural ground as measured at the maximum section along the ~~d~~Dam's longitudinal axis;
(12) "Dam Failure" has the meaning given to the term in ORS 540.443;
(13~~1~~) "Department" means the Oregon Water Resources Department;
(14~~2~~) "Director" means the Director of the Oregon Water Resources Department;
(15~~3~~) "Embankment" means an engineered earth fill;
(16~~4~~) "Emergency Action Plan" or ~~("~~"EAP"~~)~~ has the meaning given to the term in ORS 540.443~~means a plan that assists the dam owner or operator and local emergency manager perform actions that ensure the safety of people in the event of a potential or actual dam failure or in the event of a sudden release of water~~;
(17) "Engineer" means an individual who is registered in this state and holds a valid certificate to practice engineering in this state as provided under ORS 672.002 to 672.325.
(18~~5~~) "Engineer of Record" means a ~~the~~ professional engineer registered in Oregon retained by a ~~working for the~~ ~~d~~Dam owner to analyze, plan, and design a~~the~~ ~~d~~Dam to current safety standards, ~~and is responsible~~ to oversee safe construction of a~~the~~ ~~d~~Dam, to supervise Modification or removal of a Dam, or to oversee corrective actions identified by the Department, or to otherwise administer activities for a Dam;

(196) “Foundation” means the ground surface upon which a ~~d~~Dam is constructed;
(2017) “Freeboard” means the vertical distance between the high-water level in the reservoir and the low spot on the ~~d~~Dam ~~c~~Crest;
(2118) “Gate” or “Valve” means a permanent device for regulating ~~w~~Water flow through the ~~d~~Dam;
(2219) “Hazard Rating” means the categorization of a Dam ~~rating~~ established by the Department based on ~~of~~ the potential damage to life, ~~and~~ property, or public infrastructure downstream of a ~~d~~Dam in the event of a ~~d~~Dam ~~f~~Failure;
(230) “High Hazard Rating” or “High Hazard” has the meaning given to the term in ORS 540.443~~means that if a dam were to fail, loss of human life would be expected~~;
(241) “Inflow Design Flood” or ~~(~~“IDF”~~)~~ means the~~a volume and~~ peak flood flow that the ~~e~~Engineer of ~~r~~Record will design to safely pass over or through the ~~s~~Spillway;
(252) “Low Hazard Rating” or “Low Hazard” means that if a ~~d~~Dam were to fail, loss of life would be unlikely, and damage to property or public infrastructure would not be extensive;
(26) “Maintenance Action” has the meaning given to the term in ORS 540.443;
(27) “Modification” means changes to a Dam which have a potential impact on the safety of the Dam and also do not conform to the original design, but do not include changes to Dam Height, performing Maintenance Actions, or removing a Dam;
(28) “Person” includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, the federal government and any agencies thereof, Tribe(s) and tribal members;
(29) “Potentially Unsafe” has the meaning given to the term in ORS 540.443;
(3123) “Pressurized Conduit” means any pipe that penetrates into a ~~d~~Dam ~~that may have a gate, valve, or irrigation pipe placed in the dam or at the outlet~~ so that there is ~~all or a portion of the pipe within the dam is under~~ hydrostatic pressure due to the location of a Gate, Valve, or pipe connection~~when the valve is closed~~;
(3124) “Probable Maximum Flood” or ~~(~~“PMF”~~)~~ means ~~is~~ the largest flood that could occur at a specific location, determined by the most severe set of atmospheric, soil moisture and snowpack conditions that are reasonably possible at that location;
(3225) “Significant Hazard Rating” or “Significant Hazard” has the meaning given to the term in ORS 540.443~~means that if a dam were to fail, loss of life would be unlikely but damage to property would be extensive~~;
(3326) “Soil Filter” means soil with a gradation designed to inhibit movement of adjacent, finer grained soils;
(3427) “Spillway” means any structure constructed to bypass Water, including flood waters, to~~and~~ prevent ~~w~~Water overtopping the ~~d~~Dam ~~c~~Crest;~~. Dams may have two or more spillways.~~
(3528) “State Engineer” means an Engineer employed by~~registered professional engineer working for~~ the Department that is ~~, and may be~~ either the ~~D~~director or a principal assistant working for the ~~D~~director as described in ORS 536.032;~~.~~
(3629) “Tank” means a fully-enclosed (bottom and sides) hydraulic structure made from metal, reinforced concrete, rigid fiberglass, or plastic that provides its own ~~w~~Water-sealing and structural stability;~~.~~
(370) “Toe Drain” is a drainage structure designed to collect and remove seepage ~~w~~Water from the toe of the ~~d~~Dam and to discharge this ~~w~~Water in a manner where it can be measured;

(38) “Unsafe” has the meaning given to the term in ORS 540.443;
(39) “Water” means water or wastewater;
(4031) “Zoned Embankment” means an eEmbankment dDam with a cCore of low permeability materials, sSoil fFilter materials, drainage, and other materials placed to improve performance and safety of the dDam.
Statutory/Other Authority: ORS 536.027, 540.488183 & 540
Statutes/Other Implemented: ORS 540.443183 & 540 & 536
History:
WRD 2-2015, f. & cert. ef. 3-17-15
WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10
WRD 12-1986, f. & ef. 10-3-86

690-020-0023
Dam Safety Process Requirements for Construction of Dams
(1) Dam safety requirements shall be based on the hazard rating of the dam, in order to efficiently protect life and property.
(2) Any person, corporation, association, firm, partnership, limited liability company, joint stock company, unit of local government as defined in ORS 190.003, or State agency must, before beginning any construction on a dam, secure the services of a qualified engineer to design the dam and also to provide information on the dam as it was actually constructed. This engineer shall be deemed the engineer of record for the purposes of these rules.
(3) The engineer of record shall design the dam and develop plans and specifications consistent with these rules.
(4) Prior to beginning construction on any dam subject to these rules, written approval of dam designs, drawings and specifications must be obtained from the State Engineer as described in OAR 690-020-0080.
(5) The engineer of record must oversee construction of the dam consistent with rules governing administration of dam construction in OAR 690-020-0065 to evaluate whether the dam is constructed consistently with approved plans and specifications. Any essential design changes must be described and justified in a letter sent to the State Engineer with the “as-built” drawings.
Statutory/Other Authority: ORS 540.350 - 540.400
Statutes/Other Implemented: ORS 183, 536 & 543
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0024
General Department Authorities and Intergovernmental Coordination
In addition to any other powers of the Department, in carrying out its duties, functions, and powers, under these rules and ORS 540.443 through 491 and 540.995, the Department may:
(1) Enter into contracts, memorandums of understanding and intergovernmental agreements for the inspection, evaluation or study of Dams, or the response to Dam Failure or potential Dam Failure.

(2) Accept moneys from any public or private source for the administration and enforcement of these rules for enhancing the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.
(3) Coordinate with federal, Tribal, state, local, and private entities to enhance the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.
(4) Waive or reduce fees for Dams inspected by another state agency under a memorandum of understanding with the Department.
(5) Aid in the inspection of a Dam and provide advice and assistance to prevent, mitigate, or respond to a potential or actual Dam Failure if there is a potential or actual risk of Dam Failure at a Dam regulated under a federal Dam safety program.
(6) Accept the reports of consulting Engineers, engineering geologists or other specialists employed by the Dam owner.
(7) Employ consulting Engineers, engineering geologists, or other specialists to make special examinations and inspections, and to prepare reports for the Department if the Department concludes that existing reports are insufficient. The costs of such special examinations, inspections, and reports shall be paid by the Department, or upon mutual agreement, may be divided between the Department and the Dam owner.
Statutory/Other Authority: ORS 540.488, 536.027
Statutes/Other Implemented: ORS 540.488, 540.446, 540.464

~~**690-020-0025**~~
~~**General Requirements**~~
~~(1) The Director may require additional information or data beyond that specified in these rules to determine the safety of a proposed dam.~~
~~(2) The Director may include, as part of any permit to construct a dam, limitations and conditions that pertain to construction, operation, maintenance, and the protection of lives and property. These limitations and conditions become, by reference, part of the water right certificate and remain in effect throughout the life of the water right.~~
~~(3) Approved plans and specifications for construction are, by reference, considered limitations and conditions placed on the water right permit and water right certificate. The Director retains the authority to place additional limitations and conditions on the water right relative to operation and maintenance.~~
~~(4) Dams constructed or operated in violation of limitations and conditions included in the water right permit or certificate are subject to restricted use. The certificate affirms the applicant's right to store water subject to the limitations and conditions therein.~~
~~(5) For new dams on stream channels, an outlet conduit must be installed to permit drainage of all or most of the reservoir and for passage of flow to downstream, instream and out of stream water right holders or instream minimum releases unless the engineer of record provides another alternative and demonstrates the safety and efficacy of this alternative to the State Engineer.~~
~~(6) The Department shall determine water impoundment volumes in acre-feet as follows:~~
~~(a) For dams impounding water for an authorized beneficial use, the impoundment volume indicated in the area-capacity curve as measured from the bottom of the reservoir to the spillway crest. For dams with multiple spillways, 'spillway crest' is referring to the crest of the lower elevation spillway.~~

~~(b) For wastewater treatment lagoons, the impoundment volume is that indicated in the wastewater lagoon plans and specifications.~~
~~(c) For diversion or flood control dams, the impoundment volume is that calculated at full reservoir at the dam highest elevation spillway crest level.~~
~~(7) The State Engineer may approve final designs, drawings and specifications for water storage reservoirs after a water storage application and a draft final order for that application have been issued by the Department.~~
~~(8) Any person, firm or private or municipal corporation must provide to the State Engineer an evaluation of whether the dam includes measures that make it readily adaptable to power generation for any new dam over 25 feet high on a stream with average annual flow over 2 cubic feet per second, unless exempted from this requirement as provided in ORS 540.350(3).~~
~~(9) For any dam rated high hazard, the Department must review and approve an Emergency Action Plan prior to filling the reservoir.~~
~~(10) For any dam rated high or significant hazard, the Department must review and approve an operations and maintenance manual prior to construction on the dam.~~
~~**Statutory/Other Authority:** ORS 540.350 – 540.400~~
~~**Statutes/Other Implemented:** ORS 183, 536 & 543~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~
~~WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10~~
~~WRD 12-1994, f. & cert. ef. 11-7-94~~
~~WRD 12-1986, f. & ef. 10-3-86~~
~~WRD 3, f. & ef. 2-18-77~~

690-020-0026
Fees
(1) The Department may charge a fee for examination of the site, plans and specifications, features, and other supporting information regarding construction of a new Dam or construction to modify Dam Height. The fee, as provided in ORD 540.449 Oregon Laws 2019, must be paid prior to final design approval and may not exceed the lesser of the costs of providing the examination or the amounts provided in ORS 540.449 (3).
(2) Dam owners subject to the Department's laws governing Dam safety shall submit to the Department an annual fee based upon the Dam's Hazard Rating as provided in ORS 536.050 (2) to support the Dam Safety Program and administration expenses.
(a) Dam owners who fail to pay the annual fee on or before six months after the billing date may be required to pay a late fee as provided in ORS 536.050 (2).
(b) If a Dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the Dam owner notice by certified mail, place a lien on the real property where the Dam is located for the fees owed by the Dam owner.
(c) Multiple Dams directly adjacent to each other and connected together and separated only by Embankments or other manmade materials will be considered as one Dam for the purpose of determining annual fees.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.449, 536.050

690-020-0028
Preliminary Plans and Specifications for Construction of New Dams or to Increase Dam Height
(1) If a Dam requires a Water right, preliminary plans and specifications must be submitted to the Department at the time an application to appropriate Water is submitted to the Department pursuant to ORS 537. Preliminary plans and specifications are recommended for Dams that do not require a Water right.
(2) Preliminary plans and specifications must include the following at a minimum:
(a) A contour map of the reservoir site showing the proposed location of the Dam. The map should be no smaller than eleven inches by seventeen inches. The map must show the proposed location of the Spillway(s) and the Conduit inlet and outlet;
(b) Written description of the proposed Dam location both as Latitude/Longitude and Township/Range/Section;
(c) A cross section of the proposed Dam at the maximum section indicating the proposed Height;
(d) The proposed storage of the reservoir in Acre-Feet; and
(e) A brief description of geologic conditions of the proposed site. Any geologic features that could impact the safety of the Dam should be clearly described.
(3) The preliminary plans and specifications must be submitted by an Engineer, or a certified engineering geologist that is registered in the State of Oregon and is also a Certified Water Rights Examiner.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 537.400

~~**690-020-0029**~~
~~**Recommendations for Dams Under 10 Feet High or Storing less than 9.2 Acre-feet**~~
~~(1) Persons constructing or designing dams under ten feet high or storing less than 9.2 acre feet may be subject to requirements for use of registered engineers as specified in ORS 672.002 through 672.091.~~
~~(2) The Department is authorized to provide guidance for the construction of dams requiring a water right permit but not requiring State Engineer review and approval of designs, plans and specifications.~~
~~(3) Potential dam owners are advised that even small dams, should they fail, may cause injury to people and property. Dam owners should consider designs and inundation analysis methods described in OAR 690-020-0035 through 690-020-0065, 690-020-0100, and 690-020-0120.~~
~~(4) Persons proposing to build a dam under 10 feet high or storing less than 9.2 acre-feet must comply with all the requirements for a storage permit in ORS 537.409 and in OAR 690-310.~~
~~**Statutory/Other Authority:** ORS 183 & 540~~
~~**Statutes/Other Implemented:** ORS 183 & 540~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~
~~WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10~~
~~WRD 12-1986, f. & ef. 10-3-86~~

690-020-0035
Minimum Engineering ~~Design~~ Requirements for Final Design of New Dams or to Increase Dam Height
(1) No Person may build a new Dam or increase Dam Height unless the Department has first examined the site, plans and specifications, features, and other supporting information as prepared by an Engineer regarding the construction and operation of the dam~~A design report or multiple design reports must be submitted with the drawings and specifications by the engineer of record for all new dam construction. Design reports may be completed by other engineers registered to practice in Oregon.~~
(2) Final documents must be submitted by the Engineer of Record prior to construction. Design reports may be completed by Engineers other than the Engineer of Record. If multiple reports are submitted, each must be stamped by the Engineer who prepared the report.
(3) Final documents shall include:
(a) A plan for construction administration as provided in OAR 690-020-0065;
(b) An operations and maintenance plan if required by OAR 690-020-0350;
(c) An Emergency Action Plan for Dams rated High Hazard as provided in OAR 690-020-0400;
(d) Final design drawings as provided in OAR 690-020-0055; and
(e) Final design reports.
(~~4~~2) The final design report(s) ~~for new dam construction~~ must include the following elements:
(a) Site suitability evaluation as provided in OAR 690-020-0036;
(b) Hydrology and ~~i~~Inflow ~~d~~Design ~~f~~Flood as provided in OAR 690-020-0037;
(c) Dam structure design ~~(embankment, concrete or other)~~ as applicable and as provided in OAR 690-020-0038 – 690-020-0041;
(d) Spillway design as provided in OAR 690-020-0042;
(e) Design for penetrating ~~c~~Conduit(s) as provided in OAR 690-020-0043; ~~and~~
(f) Monitoring and instrumentation ~~Methods~~ for determining whether a ~~d~~Dam is operating properly based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam as provided in OAR 690-020-0044; and ~~(monitoring and instrumentation).~~
(g) A Dam Breach Inundation Analysis as provided in OAR 690-020-0120.
~~(3) If multiple reports are submitted, each must be stamped by the engineer who prepared the report and the engineer of record must compile and understand reports for preparation of drawings and specifications.~~
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15
WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10
WRD 12-1994, f. & cert. ef. 11-7-94
WRD 12-1986, f. & ef. 10-3-86
WRD 3, f. & ef. 2-18-77

690-020-0036
Design Requirements for New Dams or to Increase Dam Height: Site Suitability and~~/or~~ Geotechnical Evaluation

The design for construction of a new ~~d~~Dam or to increase Dam Height ~~construction~~ shall characterize the soil and rock at and around the ~~d~~Dam site and shall include the following elements:

(1) A description of the general and local geology and geomorphology at and around the proposed ~~d~~Dam and reservoir site.

(a) Field investigation by a geotechnical ~~e~~Engineer ~~and/~~or engineering geologist or both is required for dams rated ~~all h~~High ~~h~~Hazard. For dams rated~~and also for s~~Significant ~~h~~Hazard, field investigation by a geotechnical engineer or engineering geologist or both is required ~~dams~~ where landslides, faults, dispersive soils, or liquefiable soils could reasonably be expected near or at the ~~d~~Dam site. All such features shall be shown on a map of the ~~d~~Dam site~~,~~ and be described as necessary for design of the ~~d~~Dam.

(b) For ~~d~~Dams on located~~rock~~ on rock, a drawing must also contain mapping of discontinuities relevant to the safety of the ~~d~~Dam and include evaluation of whether~~the need for~~ grouting is required~~;~~.

(2) A ~~S~~subsurface investigation to determine the distribution of relevant earth materials.~~ This investigation~~ which shall include borings or test pits; identification of springs, seeps, and groundwater encountered at the ~~d~~Dam site; and evaluation of the potential for landslides into the ~~d~~Dam or reservoir~~;~~.

(a) All materials shall be logged by the Unified Soil Classification System; blow counts (for borings only); and include a description of samples taken for testing.

(b) Subsurface investigations for High Hazard ~~d~~Dams shall include drilling to a minimum depth of 1.5 times the Dam ~~h~~Height ~~of the dam~~ or at least ten~~10~~ feet into bedrock, whichever is less.

(3) An evaluation of ~~S~~soil and ~~or~~ rock ~~evaluation~~ and the testing of relevant materials.~~ This evaluation~~ which may include: proctor compaction testing from all borrow areas~~,~~ estimation or testing the permeability of soils to be used in ~~d~~Dam construction~~,~~ and an assessment for the presence of dispersive soils. There must be a sufficient number of tests to characterize the variability in each borrow area. In addition, an evaluation must contain the following information as applicable and as may be required by the State Engineer:

(a) An analysis of materials in the ~~f~~Foundation and proposed ~~e~~Embankment ~~shall be completed~~ if materials are prone to liquefaction or significant settlement.

(b) Where suitable materials can be collected, strength tests shall be required for all ~~h~~High ~~h~~Hazard ~~d~~Dams, and may be required by the State Engineer for ~~s~~Significant ~~h~~Hazard ~~d~~Dams.

(c) Testing of dynamic soil properties may be required for ~~h~~High ~~h~~Hazard ~~d~~Dams in areas with large ground acceleration potential from earthquake loading, if soils have potential for significant strength loss upon seismic loading.

(4) Borrow area locations. Areas proposed for borrow shall be identified and shown on the drawings~~;~~.

(5) Earthquake considerations. Seismic site characterization is required for ~~h~~High ~~h~~Hazard ~~d~~Dams, and may be required for ~~s~~Significant ~~h~~Hazard ~~d~~Dams. A seismic site characterization shall include earthquake sources, ground motion hazard, peak ground acceleration, and recommended ground motions (time histories); and~~.~~

(6) Site preparation criteria. The site evaluation shall recommend a depth of stripping unsuitable materials, and also a minimum, and where necessary, maximum depth for the ~~c~~Cutoff ~~t~~Trench.

Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0037
Design Requirements for New Dams or to Increase Dam Height: Hydrology and Inflow Design Flood
The design for construction of a new Dam or to increase Dam Height shall characterize flow into and through the reservoir and the ~~d~~Dam and shall include the following elements:
(1) A topographic map delineating the drainage area contributing to the ~~d~~Dam, with the drainage area size labeled in square miles and showing the specific location of the proposed ~~d~~Dam~~;~~.
(2) For ~~d~~Dams on stream channels, the name of the stream where the ~~d~~Dam is located, the name of the principal watershed, and a determination of average annual inflow into reservoir and potential to fill the reservoir~~;~~.
~~(3) Dam failure inundation analysis is required for any dam that might be high or significant hazard. The inundation analysis shall comply with OAR 690-020-0120.~~
(4) The ~~i~~Inflow ~~d~~Design ~~f~~Flood that is the basis of hydraulic design for the ~~d~~Dam shall be determined based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam as follows~~;~~.
(a) The ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~h~~High ~~h~~Hazard ~~d~~Dam is the Probable Maximum Flood (PMF) unless the Engineer of Record proposes to determine an Inflow Design Flood based on a quantitative analysis of risk to people.
(b) The minimum ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~s~~Significant ~~h~~Hazard ~~d~~Dam is the 0.2 percent ~~a~~Annual ~~e~~Exceedance ~~p~~Probability ~~f~~Flow.
(c) The minimum ~~i~~Inflow ~~d~~Design ~~f~~Flood for a ~~l~~Low ~~h~~Hazard ~~d~~Dam is a 1.0 percent ~~a~~Annual ~~e~~Exceedance P~~p~~robability ~~f~~Flow.
(d) The ~~i~~Inflow ~~d~~Design ~~f~~Flood for a lagoon or off channel reservoir is the maximum capacity of inflow pumps or~~,~~ ditches plus the maximum local storm precipitation over the lagoon~~;~~.
(e) For watersheds under thirty~~30~~ square miles, the ~~e~~Engineer of Record may consider just the 24-hour storm to help determine the PMF, while for larger basins the ~~e~~Engineer of Record shall utilize at least a 72-hour storm for calculating the PMF for a general storm.
~~(5) For a high hazard dam, the engineer of record may also propose to determine an inflow design flood based on a quantitative analysis of risk to people and property.~~
(~~5~~6) Designs shall include a description of all hydrologic parameters and the method used to determine the ~~i~~Inflow ~~d~~Design ~~f~~Flood hydrograph and the volume of the ~~i~~Inflow ~~d~~Design ~~f~~Flood, which is to be determined considering basin size and other factors as appropriate to the watershed above the ~~d~~Dam; and~~.~~
(~~6~~7) The design report must include the information used to develop the stage and storage capacity curve for the reservoir, including the capacity with and without excavation for construction.
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0038

Design Requirements for New Dams or to Increase Dam Height: Embankment Dam Structures

Designs for construction of a new Dam or to increase Dam Height for Embankment (soil ~~and~~ or rock) ~~d~~Dams shall include the following elements:

(1) A determination of ~~e~~Embankment stability and stable ~~e~~Embankment slope angles as follows;~~.~~

(a) Embankment ~~d~~Dams shall be designed to have stable slopes during construction, and under all conditions of reservoir operation.

(b) Standard slopes of 3:1 upstream and 2:1 downstream may be used at the discretion of the ~~e~~Engineer of ~~r~~Record for ~~l~~Low and ~~s~~Significant ~~h~~Hazard ~~d~~Dams as long as low strength materials are not used in the ~~e~~Embankment and conditions leading to elevated pore ~~w~~Water pressures are not present.

(c) ~~Dams that are rated h~~For High ~~h~~Hazard ~~must be designed as zoned embankment dams and/or include a chimney drain designed also as a filter.~~

~~(d) High hazard d~~ Dams, an analysis of ~~shall be analyzed for~~ static and seismic slope stability, and of ~~also for~~ deformation ~~analysis~~. The State Engineer may require static and ~~or~~ seismic slope stability analysis for ~~s~~Significant ~~h~~Hazard ~~d~~Dams. At a minimum, seismic analysis shall be based on full reservoir under steady state seepage conditions. Factors of safety shall be evaluated by slope stability analyses using appropriate strength parameters based on laboratory or in situ testing. For materials that can be reasonably tested either on site or in a laboratory, soil strength values may not be based on assumptions and must be made on strength testing of the appropriate soil or rock units.

(d~~e~~) High Hazard ~~d~~Dams shall be designed for the maximum credible earthquake. If the State Engineer requires seismic analysis of a ~~s~~Significant ~~h~~Hazard ~~d~~Dam, deformation analysis shall be designed for the 0.2 percent ~~a~~Annual ~~e~~Exceedance ~~p~~Probability earthquake; and~~.~~

(~~e~~f) Abrupt changes in depth of compressible ~~f~~Foundation material shall be identified and where present, the design shall prevent significant differential settlement.

(2) Analysis of seepage and leakage expected through the ~~d~~Dam and design of measures to prevent internal erosion and excess leakage as follows;~~.~~

(a) Steady state seepage and internal drainage conditions beneath, around and through the ~~d~~Dam shall be quantified for all ~~h~~High ~~h~~Hazard ~~d~~Dams, and may be required by the State Engineer for ~~s~~Significant ~~h~~Hazard ~~d~~Dams;~~.~~

(b) A ~~c~~Core of low permeability material protected by a ~~s~~Soil ~~f~~Filter is required for all ~~h~~High ~~h~~Hazard ~~d~~Dams. A ~~c~~Core and ~~s~~Soil ~~f~~Filter is required for any ~~s~~Significant ~~h~~Hazard ~~d~~Dams where the ~~e~~Engineer of ~~r~~Record or State Engineer determines piping could potentially occur. All ~~c~~Core and filter zones must be of a configuration with dimensions that can be readily constructed;~~.~~

(c) Internal drains and~~/or s~~ Soil ~~f~~Filters shall be used as needed to drain ~~w~~Water and prevent internal erosion of the ~~d~~Dam. Toe ~~d~~Drains shall be standard design practice for ~~w~~Water storage Dams~~facilities~~, but not for most wastewater lagoons; and~~.~~

(d) Internal drain pipes to collect and distribute seepage flows from internal filters and drains shall be comprised of material that is non-corrodible, designed to carry the overburden load, and be no smaller than 6 inches in diameter.

(3) A safe and accessible ~~d~~Dam ~~c~~Crest as follows;~~.~~
(a) The ~~d~~Dam ~~c~~Crest shall be of sufficient width to be accessible by equipment and vehicles for emergency operations and maintenance, and shall have a road to allow ~~c~~Crest access during periods when the ~~s~~Spillway is flowing;~~.~~
(b) The ~~c~~Crest shall have a camber sufficient to maintain the design ~~f~~Freeboard, based on the anticipated ~~c~~Crest settlement, and in no case shall the camber be less than 0.5 feet;~~.~~
(c) Roads located on the ~~d~~Dam ~~c~~Crest shall have appropriate surfacing to provide a stable base that resists rutting and provides adequate traction for access and safety in wet conditions; and~~.~~
(d) The ~~c~~Crest shall have adequate cross slopes to prevent ponding.
(4) Measures to control wave and surface erosion as follows; ~~needed.~~
(a) For reservoirs large enough to generate significant waves, the design shall include a determination of minimum ~~f~~Freeboard based on expected waves. The design shall also include slope protection for wave action if significant waves are likely; and~~.~~
(b) The downstream slope shall be provided with ~~a well maintained cover of~~ non-woody vegetative cover, or a gravel or rock surface, to prevent surface erosion. ~~No woody vegetation shall be planted on the dam during the life of the structure unless specifically designed by the engineer of record, by demonstrating that cover plants will not affect critical dam functions.~~
Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0041
Design Requirements for New Dams or to Increase Dam Height: Concrete Dam Structures
Designs for construction of a new Dam or to increase Dam Height for concrete mass ~~d~~Dams must be prepared by a structural ~~e~~Engineer and a geotechnical ~~e~~Engineer and/or engineering geologist. This rule does not apply to concrete flashboard ~~d~~Dams. Designs for all other concrete ~~d~~Dams shall include the following elements as applicable:
(1) Concrete ~~d~~Dams shall be specified as gravity, arch, arch-gravity, or buttress. Gravity ~~d~~Dams can be of conventional mass concrete or roller compacted concrete;~~.~~
(2) Dams shall be designed to be stable during construction and under all conditions of reservoir operation;~~.~~
(a) Headwater and tailwater elevations pertinent to the design shall be described with respect to both static and dynamic loading;~~.~~
(b) Uplift pressure distributions assumed for design shall be provided~~.~~; and
(c) When ~~f~~Foundation drains are used to reduce uplift, the assumed drain efficiency shall be indicated and permanent access shall be provided at the project to inspect and maintain the drains.
(3) Sliding stability shall be evaluated at lift joint surfaces, at the ~~d~~Dam ~~f~~Foundation interface, and at discontinuities in the ~~f~~Foundation materials beneath the ~~d~~Dam and ~~a~~Abutments;~~.~~
(a) Factors of safety shall be based on limit equilibrium methods.
(b) For earthquake loadings, ~~the critical acceleration (acceleration required to initiate sliding) may be less than the peak ground acceleration of the design earthquake. In such cases~~ a permanent sliding displacement may ~~shall~~ be determined in lieu of a sliding factor of safety; and~~.~~

(c) Overturning of the ~~d~~Dam on its ~~f~~Foundation shall be evaluated for static and seismic loading.
(4) Seismic stability analysis may be ~~is~~ required for ~~certain c~~Concrete ~~d~~Dams and shall demonstrate the ~~d~~Dam can withstand the design earthquake without loss of life or damage to property or public infrastructure;~~.~~
(a) High ~~h~~Hazard ~~d~~Dams shall be designed for the maximum credible earthquake based on current information from the US Geological Survey or a site specific seismic evaluation. A dynamic stress analysis that considers the dynamic characteristics of the ~~d~~Dam and the ground motions of the design earthquake shall be provided for ~~h~~High ~~h~~Hazard ~~d~~Dams; and~~.~~
(b) Where the State Engineer requires seismic analysis on ~~s~~Significant ~~h~~Hazard ~~d~~Dams, they shall be designed for the 0.2 percent ~~a~~Annual ~~p~~Probability of ~~e~~Exceedance earthquake. The Department may require a dynamic stress analysis for ~~s~~Significant ~~h~~Hazard ~~d~~Dams.
(5) When ~~f~~Foundation grouting is needed, the design for the grout curtain and/or consolidation grouting of the ~~f~~Foundation shall be described; ~~required.~~
(6) Any property essential for the structural design of the ~~Specific properties of mass~~ concrete shall be included in the design documents. These may include but are not limited to ~~that can be important to design and construction include the~~ compressive strength (at twenty-eight ~~28~~ days and one-year), modulus of elasticity, Poison's ratio, shear strength, tensile strength, volume change during drying, thermal coefficient of expansion, specific heat, thermal conductivity, permeability and durability;~~.~~
(a) As a minimum for static loadings, the assumed compressive and shear strengths for the parent concrete, lift joint surfaces, and the ~~d~~Dam ~~f~~ Foundation contact shall be provided.
(b) In addition, tensile strength assumptions for the aforementioned regions for dynamic loadings (seismic) shall also be provided; and~~.~~
(c) Air entraining agents shall be provided in the concrete mix to provide freeze-thaw protection and to improve the workability of lean mass concrete mixes. The quantity of air entrained in mass concrete shall be in the order of five~~5~~ percent.
(7) Mix design and construction methods used to minimize cracking due to temperature gradients between interior regions subject to heat of hydration effects and surfaces exposed to ambient temperatures shall be specified. Treatment of lift joint surfaces to achieve desired shear and tensile strengths shall be indicated. Treatment of contraction joints to prevent leakage ~~and/~~or to transfer load between adjacent monoliths shall be described; ~~.~~
(8) When reinforcing steel is used, the strength properties of the reinforcement shall be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements; and~~.~~
(9) The minimum ~~c~~Crest width must be fifteen ~~15~~ feet unless otherwise approved. The ~~d~~Dam ~~c~~Crest and appurtenant structures shall be accessible by equipment and vehicles for emergency operations and maintenance.
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.488, 540.449~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0042
Minimum Design Requirements for New Dams or to Increase Dam Height: Spillways

(1) ~~All d~~Dams on stream channels and all High Hazard Rated Dams must have a ~~s~~Spillway. (2) Spillway(s) design for construction of a new Dam or to increase Dam Height shall include the following minimum elements:
(a~~1~~) Utilization of ~~i~~Inflow ~~d~~Design ~~f~~Flood. Determination of ~~i~~Inflow ~~d~~Design ~~f~~Flood as described in OAR 690-020-0037 is required to determine the required ~~s~~Spillway capacity.
(b~~2~~) Hydraulic evaluation of flow through control section. Flood flow through the control section must be calculated and the minimum ~~f~~Freeboard at the ~~i~~Inflow ~~d~~Design ~~f~~Flood must be one~~1~~ foot for ~~h~~High ~~h~~Hazard ~~d~~Dams and two~~2~~ feet for ~~s~~Significant and ~~l~~Low ~~h~~Hazard ~~d~~Dams.
(c~~3~~) Optional low elevation ~~s~~Spillway. An interior ~~s~~Spillway connected to the low level ~~c~~Conduit may be used for ~~l~~Low and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, and for ~~h~~High ~~h~~Hazard ~~d~~Dams only with specific approval by the State Engineer. The capacity of the low elevation ~~s~~Spillway may be considered in design of the overflow ~~s~~Spillway.
(d~~4~~) Stable ~~s~~Spillway control section. The ~~s~~Spillway control section must be hydraulically and structurally stable for the ~~i~~Inflow ~~d~~Design ~~f~~Flood and have permanent features so that the control section is identifiable for re-measurement of cross section during routine inspections.
(e~~5~~) Spillway channel stability. Spillways shall be designed to be structurally adequate and stable under all conditions of reservoir operation. Spillway structures of ~~h~~High ~~h~~Hazard ~~d~~Dams shall be designed for earthquake ground motions per OAR 690-020-0036.
(f~~6~~) Reinforced concrete specifications for spillways. Structural elements of reinforced concrete shall be designed for both strength and serviceability. The twenty-eight ~~28~~ day strength of structural concrete shall be provided. The strength properties of the reinforcing materials shall also be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements. Treatment of construction joints and contraction/expansion joints shall be described and special provisions for strength transfer and leakage prevention identified. Air entrainment shall be provided in cast-in-place concrete if needed for freeze-thaw protection, durability, and workability.
(g~~7~~) Debris booms. For ~~h~~High and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, debris or log booms may be required. Where required, they shall be designed for the ~~s~~Spillway approach where logs and other debris may block or damage the ~~s~~Spillway structure. The design shall specify the necessary anchor capacity, and the design of the anchors.
(h~~8~~) Gates and Flashboards. Detailed drawings and specifications are required for ~~s~~Spillway ~~g~~Gate structures or flashboards, if present on the proposed ~~d~~Dam. Operations and maintenance manuals are required for any ~~d~~Dam with a ~~g~~Gated ~~s~~Spillway, or where flashboards or stop-logs are used in the ~~s~~Spillway as per OAR 690-020-0350.
(i~~9~~) Energy dissipation. The design of stilling basins for ~~h~~High ~~h~~Hazard ~~d~~Dams, and where required by the State Engineer for ~~s~~Significant ~~h~~Hazard ~~d~~Dams, shall be based on calculated hydraulic forces and designed to dissipate energy from the I~~i~~nflow ~~d~~Design ~~f~~Flood.
(3) Low and Significant Hazard Dams constructed off channel are not required to have a Spillway, if redundant mechanisms to prevent overfilling are included in the design.
Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0043

Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit (s) and Control of Flow Through Conduits

All New Dams on stream channels must have a low level Conduit. All other new Dams and Dams with increases to Dam Height must have a low level Conduit or other means to safely drain the reservoir. The Conduit and related control structures must be designed to meet the following criteria:

(1) Ability to lower the reservoir. The minimum diameter of the Conduit should be determined through analysis of the time required to drain the Dam at average annual inflow;

(a) The Conduits for High Hazard Dams shall be capable of releasing the amount of Water which could be stored in the top five feet of the reservoir in five days.

(b) The Conduits for Significant and Low Hazard Dams must be able to release the amount of Water which could be stored in the top five feet of the reservoir in ten days.

(c) All Conduits must be of sufficient size to allow passage of inflows as needed.

(d) In no case shall Conduits be smaller than eight inches in diameter.

(2) Durable and water-tight Conduits. Conduits must be made of medium to heavy gage durable materials. Pipe joints must be designed to seal and prevent leakage. Corrugated metal culverts are only acceptable for Low Hazard Dams, and only when the Conduits are encased in concrete. Encasement of Conduits in concrete may be used to assist in the design of a durable Conduit and to reduce the potential for seepage and erosion adjacent to the Conduit;

(a) Diaphragms using materials designed as an effective Soil Filter are required for any Conduits not designed as encased in concrete, and are required regardless of encasement for all High Hazard Dams.

(b) Seepage collars may not be used in any Dam.

(3) Control Mechanisms. The design for the control mechanism must be sturdy, and durable. The control mechanism must allow for air venting when needed, and allow manual operation to drain the reservoir if hydraulic or other power controls are inoperable. Hydraulic or other power controls must have redundancy if control relies on any submerged hydraulic or pneumatic hoses or electrical conduits. Intake structures for outlet works must have trash racks unless the Engineer of Record shows trash racks are unnecessary, or Unsafe to Construct due to conditions at the Dam site. For High and Significant Hazard Dams, measures to prevent unauthorized use of the control mechanism must be included in this design;

(4) Outlet structure. The outlet structure must not be submerged when the inlet control Gate or Valve is fully closed. The outlet structure must be designed to protect the Conduit from mechanical damage and convey Water to the stream channel without channel erosion and cavitation near the Gate structure; and

(5) Pressurized operation. Conduits must be specified as suitable for pressurized operation if they are to be operated with controls other than at the inlet of the Conduit. Conduits for Dams with Pressurized Conduits shall have a guard Gate installed at the upstream end of the Conduit. Operations and maintenance plans manuals are required for any Dam designed for pressurized operation as per OAR 690-020-0350, and the plans must include procedures for periodic inspections of the interior of any pressurized pipes.

Statutory/Other Authority: ORS 536.027, 540.488540.350 - 540.400

Statutes/Other Implemented: ORS 540.449, 540.488183, 536 & 540

History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0044
Design Requirements for New Dams or to Increase Dam Height: ~~Monitoring and~~ Instrumentation for Monitoring
Designs must include methods for determining if the ~~d~~Dam is operating properly based on the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam, and include:
(1) A plan to share monitoring data with the Department
(2~~1~~) Staff gage near controls for the ~~c~~Conduit or where they can easily be seen by the Dam owner or operator. The staff gage shall be clearly marked in feet and tenths of feet, and extend to within one foot of the ~~crest of the d~~Dam Crest. Markings and numbers on the gage rod shall be of sufficient size to be easily readable from the Dam Crest; ~~crest of the dam.~~
(3~~2~~) Multiple and easily accessible outlets of all ~~t~~Toe ~~d~~Drains. Toe ~~d~~Drains shall be designed to discharge into locations where flows can be evaluated and monitored. Multiple discharge points are required in order to isolate seepage to various sections of the ~~d~~Dam and ~~f~~Foundation. Discharge points must be located where routine ~~d~~Dam maintenance is not likely to damage the drains; ~~.~~
(a) For ~~h~~High ~~h~~Hazard ~~d~~Dams, drains must have a measuring weir or other device, and a basin for settling drainage ~~w~~Water so that internal erosion can be identified.
(b) Where drainage galleries are provided for concrete ~~d~~Dams, seepage measuring devices should be provided and accessible for making the necessary readings.
(4~~3~~) Unique Identification. All instrumentation and exterior drains shall be labeled with a unique identifying marker designed for durability and to withstand maintenance activities; and~~.~~
(5~~4~~) All ~~h~~High ~~h~~Hazard and where required by the ~~e~~Engineer of ~~r~~Record or State Engineer, ~~s~~Significant ~~h~~Hazard ~~d~~Dams shall have the following instrumentation:
(a) Monuments that allow measurement of the horizontal and vertical movements of the D~~d~~am. Control or benchmark monuments shall be placed in areas not subject to movement.~~;~~
(b) Piezometers to allow monitoring of the phreatic surface within the ~~d~~Dam or for concrete ~~d~~Dams, to determine uplift pressures. Standpipe piezometers must be installed pursuant to monitoring well standards. (OAR 690-240-0525)
(c) Instrumentation to measure strong ground motions for publically owned ~~d~~Dams in locations where the peak ground acceleration in the 0.2 percent annual probability of exceedance earthquake is greater than 0.3~~4~~g at the ground surface.
Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0047
Design Requirements for New Dams or to Increase Dam Height: Geosynthetics
Geosynthetics shall not be used as the sole element employed to perform ~~an essential d~~Dam safety function. Redundant design features are required whenever geosynthetics are used for ~~essential d~~Dam safety functions.

Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0048
Modification of Standard Design Requirements
Exceptions to design standards may only be obtained with written approval from the State Engineer. Where the ~~e~~Engineer of ~~r~~Record requests design exceptions, the request must be in writing, be affixed with the ~~e~~Engineer of ~~r~~Record's professional stamp, and include a report describing why design standards are inapplicable to the safety of the ~~d~~Dam.
Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0055
Design Requirements for New Dams or to Increase Dam Height: Design Drawings
The ~~e~~Engineer of ~~r~~Record shall submit applicable drawings when the ~~e~~Engineer believes the design is ready for review and approval by the State Engineer.
(1) Drawings must accurately portray the work to be accomplished and be of sufficient detail to clearly define all features of the project. After all changes required by the State Engineer are made, final design drawings must be neatly and accurately drawn to a scale sufficiently large for the drawings to be readily interpreted.
(2) Drawings must be uncluttered and easy to understand for determination of design compliance by the contractor, the ~~e~~Engineer of ~~r~~Record, and the State Engineer.
(3) Drawings must be no larger than 24" X 36". Other acceptable sizes for drawings are 17" X 22" and 22" X 34". All drawings must have a graphic scale bar so that scale can be determined after enlargement or reduction. Each sheet shall be numbered sequentially with the first sheet being sheet number one along with the total number of sheets; e.g., 1 of 6.
(4) Drawings shall include the following information:
(a) An official ~~d~~Dam name, which must not have already been used for a ~~d~~Dam as indicated in the Oregon ~~d~~Dam ~~s~~Safety ~~d~~Database. This unique name must be affixed on each drawing;
(b) The first drawing must include a location map with the drainage basin, the ~~d~~Dam and reservoir, streams within the drainage area, and the location of the nearest access highway. This drawing must include legal location of the ~~d~~Dam (including Section, Township and Range), and the location of the survey reference point with latitude, longitude, elevation, and datum elevation (in NAVD1988);
(c) A contour map of the reservoir site showing the legal location of the ~~d~~Dam with a contour interval no greater than five~~5~~ feet. A plan of the ~~d~~Dam should be superimposed on this map. If scale permits, this drawing should show the location of the ~~s~~Spillway(s), ~~c~~Conduit inlet and outlet, and the location, distance and direction to a government land corner or other permanent survey marker;

(d) An Aarea and storage capacity curves showing the total capacity to the top of the Dam, with the Spillway Crest elevation identified. Surface area and storage capacity curves must be in acres and Acre-Feet, respectively; and information on the hydrology of the proposed reservoir drainage area in square miles;
(e) A profile of the dDam site at the center of the dDam;
(f) A cross section of the dDam at maximum section;
(g) Plan view(s) of dDam at maximum section, and other sections as needed;
(h) Cross section(s) of dDam, including the maximum section with the official dDam hHeight;
(i) Spillway details, sSpillway approach control discharge, and energy dissipation;
(j) Low level cConduit details, including diameter, material, encasement; and
(k) Slide gGate or vValve details including the trash rack, control stem, pedestal and wheel, or other control details, and air vent.
(5) Elevations must be clearly labeled on applicable drawings and include the:
(a) Base of dDam and official Dam hHeight of dam;
(b) Dam cCrest;
(c) Spillway control section;
(d) Base of sSpillway discharge; and
(e) Invert of the cConduit at both the inlet and outlet.
(6) All drawings must be dated and have sufficient space for State Engineer's approval stamp, at least 3" x 3" near the lower right hand corner of the drawing.
(7) Drawings must be designated as final design drawing or aAs-bBuilt dDrawings.
Statutory/Other Authority: ORS 536.027, 540.488 540.350 - 540.400
Statutes/Other Implemented: ORS 540.449, 540.488 183, 536 & 540
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0060
Design Requirements for New Dams or to Increase Dam Height: Construction Specifications
All drawings for dDams must be accompanied by construction and material specifications that include the following:
(1) Construction conditions. Specifications must include the construction period based on typical weather for that location and in and stream conditions for that location and work periods if applicable, and may include a process for the eEngineer of rRecord to modify the construction period.
(2) Clearing of the dDam site and reservoir. Specifications must include the area to be submerged by the new or enlarged reservoir and specify that the submerged area shall be cleared of logs and debris prior to filling the reservoir. The specifications must require that the footprint of the dDam shall be cleared of all soils containing organic materials, and that this material may not be used for dDam construction.
(3) Cutoff tTrench requirements. Specifications must include the minimum trench depth, width at base of the trench, and maximum side slope steepness. These specifications shall be based on the subsurface investigations and direct that the cCutoff ttrench may not be filled if it contains standing wWater. A Specifications must also include a requirement not to begin filling the

~~c~~Cutoff ~~t~~Trench until approved by ~~e~~Engineer of ~~r~~Record, and where specified, ~~by State Engineer or Dam Safety Engineer, must also be included in the specifications~~ approved by the Department.

(4) Material specification standards. The specifications shall include material and testing specifications for ~~d~~Dam materials, ~~c~~Conduits, control structures, and other appurtenant structures, using an ASTM standard methodology if available.

(5) Soil Compaction. The typical compaction specification is ninety-five~~95~~ percent of standard proctor density, though the ~~e~~Engineer of ~~r~~Record may use a different compaction standard. Specifications shall include the types of acceptable compaction equipment, by material source if necessary. Specifications shall also include maximum lift thickness. ~~To reduce potential for leakage around the conduit, s~~Specifications shall prohibit soil compaction dry of optimum moisture content to reduce potential for leakage around the Conduit. ~~f~~For materials placed immediately above or adjacent to the ~~c~~Conduit, ~~. S~~specifications must also include verification testing of soils, with representative samples selected for testing as directed by the ~~e~~Engineer of ~~r~~Record ~~and not the contractor~~. Specifications must also require verification of testing of soil compaction, with representative samples selected for testing by the Engineer of Record, or Engineer's representative.

(6) Concrete placement. Specifications shall include means to prevent separation of aggregate and cement, air entrainment requirements if needed, methods for placement and vibration of concrete, required minimum twenty-eight~~28~~ day strength, slump, moisture and temperature requirements for curing. Alkali reactive aggregate shall not be used in the concrete.

(7) Conduit specifications. Specifications must include the material, diameter, and thickness of the ~~c~~Conduit, and the length of ~~c~~Conduit required for the project. Methods for sealing joints must be specific. Specifications must require that all materials from a manufacture are certified to meet this test, or that the ~~e~~Engineer of ~~r~~Record has tested the materials directly.

(8) Accepting and Rejecting Materials. Specifications must include tolerances for acceptable departure from material specifications and a process for rejection of defective materials or workmanship.

(9) Notification by the ~~e~~Engineer of ~~r~~Record to the State Engineer of changed conditions critical to the safety or operations of the ~~d~~Dam. Specifications shall include State Engineer notification if previously unidentified springs, slope movement or sand lenses are identified, or if storm or other damage occurs during construction.

(10) ~~The specifications must require supervision by the e~~Engineer of ~~r~~Record or their qualified employees must supervise construction as needed to ensure compliance with the approved construction plans and specifications. ~~during construction and for inspection by the Director or Director's authorized representative at any time during the construction period.~~

(11) The specifications must also contain a provision to the effect that plans or specifications shall not be altered or changed without the written approval of the State Engineer.

Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~

Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~

History:

WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0065

Plan Requirements for New Dams or to Increase Dam Height: Construction Administration ~~Dam Construction~~

(1) The Engineer of ~~r~~Record shall submit plans for administering the construction of the ~~d~~Dam to the State Engineer for approval. Construction plans must include the following:

(a~~1~~) ~~Construction of the dam shall be observed and documented by the engineer of record and employees working for the engineer of record as applicable.~~

~~(2)~~ A provision stating that ~~T~~the ~~e~~Engineer of ~~r~~Record or an employee ~~inspector~~ working for the E~~e~~ngineer of ~~r~~Record shall be on-site as needed for instructions to the contractor, approval of initial excavation, acceptance of materials, and general project administration.

(b~~3~~) The ~~d~~Dam owner shall cease construction activity if the ~~e~~Engineer of R~~r~~ecord is no longer retained~~employed~~ or for any reason cannot complete necessary construction administration activities. Construction may resume when a new ~~e~~Engineer of ~~r~~Record is employed, the State Engineer has been notified of the new ~~e~~Engineer of ~~r~~Record, and both ~~e~~Engineers have discussed the project.

(c~~4~~) A provision stating that ~~T~~the ~~e~~Engineer of ~~r~~Record is responsible for~~shall observe~~ the construction of the ~~d~~Dam consistent with approved design and construction documents. ~~. It is the engineer of record's responsibility to make~~ This provision should describe periodic inspections to evaluate whether the construction is proceeding in accordance with the approved plans and specifications and describe how the ~~. The e~~Engineer of ~~r~~Record will take actions ~~shall endeavor~~ to prevent defects and deficiencies in the construction of the ~~d~~Dam and ~~appurtenant structures, and shall disapprove or reject~~ require work identified that fails to conform to ~~the approved plans and~~ specifications be corrected.

(d~~5~~) A provision stating that ~~T~~the ~~e~~Engineer of ~~r~~Record shall confirm foundation design assumptions once surface materials have been stripped and the ~~c~~Cutoff ~~t~~Trench excavated. Changes in actual ~~f~~Foundation conditions from assumptions made in the initial site evaluation shall be communicated to the State Engineer~~Department.~~

(2~~6~~) A provision in which ~~T~~the ~~e~~Engineer of ~~r~~Record shall maintain a record of construction that shall include:

(a) Logs of construction inspections whenever such inspections are made by the ~~e~~Engineer of Record or the ~~e~~Engineer of Record's employee;

(b) All test results pertaining to construction;

(c) Photographs; and

(d) Construction problems and remedies.

(3~~7~~) A provisions stating that ~~T~~the ~~e~~Engineer of ~~r~~Record shall complete and stamp ~~a~~As-built ~~d~~Drawings and a final construction report, including statements that the observations are either consistent or inconsistent with the design drawings and specifications. If key elements of construction were not observed, the construction report shall detail those specific elements that were not observed.

Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~

Statutes/Other Implemented: ORS 540.449, 540.488 ~~183, 536 & 540~~

History:

WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0068
Plan Requirements for New Dams or to Increase Dam Height: Operations and Maintenance Plan
(1) The Engineer of Record shall include an operations and maintenance plan with submittals for construction of:
(a) Any Dam rated Significant or High Hazard; and
(b) Any Low Hazard Dam with:
(A) A Gate or flashboard as part of the Spillway; or
(B) A Valve on a Conduit that is not on the upstream side of the Dam.
(2) The Department may review implementation of the operations and maintenance plan during Dam safety inspections.
(3) Operations and maintenance plans shall include, but are not limited to:
(a) Directions for filling and emptying the reservoir when needed;
(b) Frequency of inspection of the interior of Conduits, including qualifications and guidance for Persons conducting and reporting on this inspection;
(c) Procedures for operation of all Gates and Valves;
(d) Specified minimum frequency for cycling and lubrication of all Gates and Valves;
(e) Standards for removal of trees and brush, and mowing other vegetation; including the frequency for the Dam owner to monitor vegetation and to take action to control brush if it obscures any face of the Dam, the Conduit or the Spillway;
(f) Frequency of routine Dam observations, including identification of changes in seepage and maximum permissible Dam deformations;
(g) A Water release plan in the event of a flood forecast when reservoir is above a certain level;
(h) The measurement frequency for all monitoring instrumentation installed at the Dam; and
(i) Review and evaluation of conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, including actions identified in [OAR 690-0250].
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.449, 540.488

690-020-0070
New Dams or to Increase Dam Height: Submittals and Notifications by the Engineer of Record
(1) ~~When necessary, t~~The ~~e~~Engineer of ~~r~~Record must include an inundation analysis that complies with OAR 690-020-0120 prior to submitting the design report, plans and specifications and other documents, so that the Department can determine the ~~h~~Hazard ~~r~~Rating of the ~~d~~Dam.
(2) All final designs, drawings and specifications submitted to the State Engineer for approval must be prepared and stamped by an Engineer ~~professional engineer licensed to practice in the State of Oregon~~. The first page of the drawings, the specifications, and the construction administration plan must be stamped by the ~~e~~Engineer of ~~r~~Record. All submitted materials must be addressed directly to the State Engineer and labeled as a ~~d~~Dam safety submission.
(3) Final drawings shall be submitted on full size paper. The design reports and specifications must be submitted as packaged 8.5 x 11 inch bound documents, with ~~essential~~ maps folded within.

(4) For High Hazard rated Dams, the final Emergency Action Plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the Engineer of Record prior to commencing construction.
(54) A schedule of construction shallwill be provided to the State Engineer prior to initiating construction of any sSignificant or hHigh hHazard dDam.
(65) Prior to completion of the cutoff trench and all stripping of foundation and embankments tThe eEngineer of rRecord shall notify the State Engineer to allow for Department State Engineer inspection of the excavation prior to completion of the Cutoff Trench and all stripping of Foundation and Embankments. The required notice to the State Engineer is as follows:
(a) 48-hours for a lLow hHazard dDam;
(b) 120-hours for a sSignificant hHazard dDam; and
(c) for high hazard dams, 240-hours or the time specified in the approval, whichever is longer for High Hazard Dams.
(76) Any changes made to the designed location, hHeight or width of the dDam, or to materials used in dDam construction shall be reported in writing immediately to the State Engineer.
(87) If aAny slope instability is observed during construction in the eEmbankment or adjacent to the dDam or into reservoir, it shall immediately be reported to the State Engineer by phone.
(98) If for any reason tThe eEngineer of rRecord ceases construction administration work, the engineer of record must immediately notify the State Engineer if they are no longer the Engineer of Record. The notification shall be by phone and in writing.of the situation, by phone and in writing.
(9) For high hazard rated dams, the final emergency action plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the engineer of record prior to or concurrent with submission of the as-built drawings and the project completion report.
(10) The eEngineer of rRecord must submit as-built drawings and a project completion report upon completion of the Dam. A project completion report must include the following:
(a) As-built dDrawings.,- i If possible, on the same sheet as the initial design drawings. As-built drawings shall be on the same sheet as the initial design drawings;submitted in the form of electronic copies of all applicable drawings;
(b) Sufficient information to document A completion report stating either that the dDam has been built according to the drawings with changes to improve safety as documented in the aAs-built dDrawings, or that criticalessential safety functions are unknown;
(c) A list of the datesdays the eEngineer of rRecord was on site, the number and location of material tests, and observations of all changed conditions;
(d) Material Ttesting results (compaction, strength, permeability) must be summarized in the completion report;
(e) The completion report must document the oObservations and decisions made and communicated to the contractor or dDam owner;.
(f) Photographs of key stages of construction, including but not limited to photographs of the eCutoff tTrench, borrow pit development, trenching and placement of the eConduit, the sSpillway before and after placement of concrete; and
(gf) The signed professional stamp of project completion report shall be stamped by the eEngineer of rRecord.

Statutory/Other Authority: ORS 536.027, 540.488 ~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.488, 540.449 ~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0080
New Dams, or to Increase Dam Height: Written Approval by State Engineer
(1) ~~Prior to commencing construction activity, all design reports, drawings of the dam and critical appurtenant structures, specifications, and plans for construction administration must be approved by~~ No person shall Construct a Dam unless the State Engineer has ~~indicated by the State Engineer's stamp and a written letter of approval from the State Engineer.~~
~~(2) The State Engineer's approval of design plans and specifications shall be valid only for five years. Upon request, written requests for time extensions may be granted in writing~~ reviewed all necessary reports, drawings, plans and other information as submitted by the ~~State~~ Engineer of Record and has approved those documents as indicated in written communication with the Engineer of Record.
(2) Prior to commencing construction activity, the Engineer of Record shall verify that all necessary documents related to the final design are approved as indicated by the State Engineer's stamp on those documents.
~~(3) The following activities which involve the construction or operation of an existing permitted dam that may impair the safety of the dam require State Engineer approval of engineered designs:~~
~~(a) Any changes that affect storage capacity of the dam or increase dam height above that in the approved drawings for the dam, including all dam rises other than adding fill to restore crest height lost to settlement or erosion;~~
~~(b) Any changes to or near the spillway that may affect spillway capacity or ability to pass flows safely;~~
~~(c) Installation of any valve or gate on the downstream side of the dam;~~
~~(d) Removing and replacing or otherwise excavating into or near the dam to place or replace any conduit or utility in the dam;~~
~~(e) Replacement of the conduit control structure;~~
~~(f) Installation of any valve on the downstream side of the low level conduit, or directly connecting irrigation pipe to the low level conduit;~~
~~(g) Repair of damage which has already significantly weakened the dam;~~
~~(h) Any activity where at least 30 percent of fill material in the dam is impacted by that activity; and~~
~~(i) Any other change to the dam that affects its safety as determined by the State Engineer.~~
~~(4) Prior written approval will not be required for replacement or lining of toe drains, relining of conduits of low hazard dams, and for specific actions required in a safety emergency. As-built drawings may be sent to the State Engineer after completion of such projects to show these projects have been completed in a safe manner.~~
(3~~5~~) ~~For pre-existing dams without a valid storage permit, t~~The State Engineer's ~~may~~ approvale of design plans and specifications shall be valid only for five years from the date of approval.

Upon request, written requests for time extensions may be granted in writing by the State Engineer. ~~so that a permit may be issued only if the engineer of record provides the following:~~
~~(a) Drawings of the dam as it exists during the engineer's evaluation and survey of the dam. These drawings should include all the critical features as described in OAR 690-020-0035, except for those elements that cannot be evaluated such as the cutoff trench;~~
~~(b) Evaluation of any embankment distress, including erosion, seepage or leakage;~~
~~(c) Condition and function of the conduit and its controls, capacity and stability of the spillway;~~
~~(d) Any other safety information needed as determined by the State Engineer;~~
~~(e) Designs as needed to bring the dam up to the current standards based on the hazard classification of that dam;~~
~~(f) As improved drawings of the dam showing that all necessary modifications have been made with a report from the engineer describing the necessary work that was completed; and~~
~~(g) The source of all information used to develop the as-improved drawings must be documented in a report submitted by the engineer. This includes but is not limited to the engineer's measurements, engineer's observations, a photographic record, and testimony of individuals.~~
(4~~6~~) No newly constructed ~~d~~Dam or Dam that has had Height modified may store ~~w~~Water until final written acceptance of ~~approval of necessary plans, specifications or other information is received from the Department.~~
~~(a) Final approval may be obtained only after construction has been completed and as-built drawings and~~ a satisfactory project completion report has~~ve~~ been submitted to and accepted~~approved~~ by the Department~~State Engineer~~.
(5~~b~~) The Department~~State Engineer~~ shall notify the ~~e~~Engineer of ~~r~~Record and ~~d~~Dam owner in writing when the project completion report has~~final documents have~~ been reviewed and accepted by the Department~~approved~~.
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.488, 540.449~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0100
Hazard Rating of Dams
(1) The Department ~~Dams~~ shall ~~be~~ assign~~ed~~ all Dams a ~~h~~Hazard ~~r~~Rating of ~~h~~High, ~~s~~Significant, or ~~l~~Low.
(2) ~~The Department shall utilize dam breach inundation analysis as a primary factor to determine the~~ A High ~~h~~Hazard rating will be based on the Dam breach inundation analysis as described in ~~of dams as described in~~ OAR 690-020-0120 using the following criteria:~~.~~
~~(3) Using the dam breach inundation analysis described in OAR 690-020-0120, the Department shall make the final determination of any hazard rating using the following criteria:~~
(a) An inundation depth of flowing ~~w~~Water of at least two feet over the finished floors of dwellings, other frequently occupied buildings, or road surfaces where a vehicle is likely to be present. The Department may also consider Water velocity in its determination of inundation depth establishing a High Hazard Rating. ~~establishes a "high hazard" rating~~.
~~(b) Any inundation depth of water over the floorboards of structural buildings establishes a "significant hazard" rating.~~

(bc) An incremental increase of depth of flowing Water of 1 foot where recreational or other frequent use occurs downstream to prevent probable loss of life. The Department will also use Water velocity in its determination of inundation depth establishing a High Hazard Rating. For other roads and vulnerable utilities, an inundation depth of two feet or evidence of depth and velocity capable of creating damage establishes a "significant hazard" rating.
(d) Wherever heavy recreational or other frequent use occurs downstream a "high hazard" rating shall be established to prevent probable loss of life. Such designation shall not depend on the presence of downstream infrastructure.
(e) For water depths close to those listed in the subsections (a) and (c), the Department may also consider water velocity in its determination of hazard rating.
(3) A Significant Hazard Rating will be based on the Dam breach inundation analysis described in OAR 690-020-0120, using depth and velocity of the flowing Water at affected structures, public infrastructure, and other properties which shows likely damage to property and infrastructure but no loss of life.
(4) Any Dam that is not rated as High or Significant by the Department will be rated as Low Hazard.
(54) The hHazard rRating of a dDam shall remain in effect until the rating is revised by the Department. The Department may conduct Hazard Rating reviews and Dam Breach Inundation Analyses as evidence indicates the impacts to people, property, or infrastructure may have changed since the Hazard Rating was first set. The Dam owner will be notified of the change and have an opportunity to meet with the Departmentusing the procedures described in OAR 690-020-0120. A dam owner may request that the Department revise a hazard rating. The owner must provide information in support of the request and prepared by an engineer licensed in Oregon and familiar with hydraulic and hydrologic calculations and using the procedures described in OAR 690-020-0120.
(6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inundation analysis, in support of this request.
Statutory/Other Authority: ORS 536.027, 540.488183 & 540
Statutes/Other Implemented: ORS 540.443, 540.488183 & 536 & 540
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0120
Dam Breach Inundation Analysis
(1) Any simplified and conservative hydraulic model may be used for the dDam breach inundation analysis must be submitted with the design for any new dam, except only for dams in a remote location far enough from buildings, high use recreation sites or high use public roads so that damage or fatalities from a dam breach would be very unlikely as determined by the State Engineer.
(2) A dam breach inundation analysis is required to change the hazard rating of an existing dam.
(3) The dam breach inundation analysis must use a breach time based on dam materials and thickness and other factors that would influence the time it would take for the dam to breach from internal erosion, overtopping, or displacement.

~~(4) Any simplified and conservative hydraulic model may be used~~ to show that a ~~d~~Dam should be rated ~~l~~Low ~~h~~Hazard. The State Engineer may determine if the model was used appropriately and conservatively.

(~~2~~5) An accepted and hydraulically consistent computational model~~s~~ must be used to conduct the inundation analysis for ~~s~~Significant and ~~h~~High ~~h~~Hazard ~~d~~Dams~~., as these will be used in the event of an emergency at the dam. Models developed by the US Army Corps of Engineers including HEC-RAS are the preferred methods of analysis. Other models that use hydrodynamic equations checked for minimum tolerances such as FLO 2D are also acceptable for conducting dam breach inundation analysis. Information on the specific model used for analysis, dam breach parameters and justification, and all assumptions made for the analysis must be included in the documentation for the inundation analysis.~~

(3) A report summarizing the model information and results must be stamped and submitted to the Department by the Engineer of Record. The summary report shall contain sufficient information to reproduce the model and shall include at a minimum the following information:

(a) The specific proprietary model name or method used for the analysis;

(b) Details regarding the model geometry;

(c) The specific mode of failure and any assumptions made in the selection of the mode of failure;

(d) A list of Dam breach parameters and any assumptions made in the selection of breach parameters. The breach parameters must be based on Dam material and thickness and any other factors that would influence the time it would take for the Dam to breach from internal erosion, overtopping, or displacement;

(e~~6~~) ~~Inundation analysis for~~ A list of all boundary and initial conditions and any assumptions in the selection of these conditions. For High ~~hazard rating of high~~ and ~~s~~Significant ~~h~~Hazard ~~d~~Dams, the analysis must be conducted with ~~the~~ reservoir at full pool and inflow equal to ~~the~~ 0.2 %~~percent~~ ~~a~~Annual ~~e~~Exceedance ~~p~~Probability ~~f~~Flood flow. ~~The analysis must show on a~~

(f) A map areas indicating the inundation boundary~~inundated~~, areas inundated by a depth greater than 2 feet, and all frequently occupied structures that fall within or immediately adjacent to the inundation boundary;~~.~~

(g) The breach flow as calculated by the model immediately downstream of the Dam. If an empirical formula was used as the basis for determining breach flow, the formula and all inputs must be clearly stated; and

(h) A sensitivity analysis evaluating the variability in model inputs may be required when the Dam breach inundation analysis results indicated the Hazard Rating is on the border between two ratings.

~~(7) The following additional information shall also be required for newly constructed or modified high hazard rated dams.~~

~~(a) A sunny day and a PMF inflow analysis as part of the emergency action plan.~~

~~(b) The inundation mapping must include cross sections with depth and times to flood wave arrival, and must be extended downstream to a location where no significant property damage exists.~~

Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~

Statutes/Other Implemented: ORS 540.443, 540.488~~183, 536 & 540~~

History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0140
Modification of Dams
(1) No person shall Modify a Dam unless the State Engineer has reviewed all required documents described in the following sections and has approved those documents as indicated in written communication with the Engineer of Record or the Dam owner.
(2) The following Dam modifications require State Engineer approval of plans:
(a) Any changes to or near the Spillway that may affect Spillway capacity or ability to pass flows safely;
(b) Placing, replacing, or relining any Conduit or utility in the Dam;
(c) Replacement of the Conduit control structure;
(d) Installation of any Valve on the downstream side of the low level Conduit, or directly connecting a pipe to the low level Conduit;
(e) Repair of damage that may have a potential impact on the safe functioning of the Dam;
(f) Any activity where 10 percent or more of the fill material in the Dam is disturbed; or
(g) Any other change to the Dam that results in a deviation from the original design and that affects the safe functioning of the Dam
(3) Dam Modification plans shall include all details of the area of the Dam being modified. Specific modification plan requirements include, but are not limited to:
(a) For major Spillway repairs, plans need to address passage of the required Inflow Design Flood based on the Hazard Rating of the Dam, with the same criteria as required for new Dams in OAR (690-020-0037);
(b) For repairs of slope movement, plans require slope stability analysis and appropriate corrective measures;
(c) For replacement of Conduits or installation of a Valve on the downstream side of a Dam, plans require an analysis of internal erosion potential;
(d) For internal erosion, plans must address construction of a filter zone; and
(e) Items required by the State Engineer pursuant to subsection 4.
(4) The Dam owner shall provide sufficient notice to the Department to allow for adequate time for discussion of the proposed Modifications and the necessary design requirements.
(5) The State Engineer will determine the design and submittal requirements. Submittal requirements and Department reviews may be expedited in the event of emergency or unanticipated weather-related situations.
(6) Water is not to be stored in the reservoir during modification. The Engineer of Record may proposed maintaining some Water in storage during Dam Modification or modifying Dam Height if it is demonstrated that can be done in a manner that protects life, property, and infrastructure. The Department will review submitted materials for the proposed construction actions. The Department may consider the scope of the project, including how the proposed construction actions will maintain safe Water levels through the duration of construction.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.443, 540.449, 540.488

~~**690-020-0150**~~
~~**Routine Inspection of Dams**~~
~~(1) The Department shall maintain a program of inspecting dams and may conduct routine safety inspections of dams with an inspection frequency based on the hazard rating of the dam and may specify modifications necessary to insure the safety of the works to prevent possible damage to life or property.~~
~~(2) The frequency of inspections may be based on the hazard classification of the dam. Inspections may occur as follows:~~
~~(a) Inspections for high hazard dams may be scheduled on an annual basis;~~
~~(b) Inspections for significant hazard dams may be scheduled every three years; and~~
~~(c) Inspections for low hazard dams may be scheduled every six years.~~
~~(3) Expedited inspections may be conducted if an urgent dam safety issue is identified or if there is a potential change in hazard classification.~~
~~(4) Following an inspection, the Department shall provide to dam owners a letter with the inspection observations and recommendations that assist the dam owner to ensure the safety of the dam.~~
~~**Statutory/Other Authority:** ORS 540.350 - 540.400~~
~~**Statutes/Other Implemented:** ORS 183, 536 & 540~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~

690-020-0160
Removal
(1) Dam owner(s) seeking to remove or partially remove any Dam that has a High or Significant Hazard Rating must notify the Department.
(2) Dam owner(s) shall provide the Department with a removal plan for evaluation prior to removing the Dam. Plans must be submitted a minimum of 60 days in advance of removal to allow reasonable time to evaluate the removal plan, unless the Department agrees to a different timeframe.
(3) A removal plan must include:
(a) Descriptions and assumptions for the removal or partial removal of the Dam;
(b) A description of the means for removing the Dam to prevent future impoundment and a method of draining the reservoir in a controlled manner prior to the start of the removal;
(c) A schedule listing the major events and corresponding time frame that will occur during the removal;
(d) A plan for disposal and stabilization of Dam material; and
(e) In the case of a partial removal, a drawing showing the planned removal location, breach dimensions including side slopes, and lowest elevation of the breach. For any partial removal, the removal plan must show that there will be sufficient material removed and left at slopes that will allow no breach flood by erosion of remaining materials.
(4) The Department may evaluate the removal plan to ensure that the plan includes appropriate safety precautions to protect life, property, and public infrastructure from temporary inundation in the area below the Dam during Dam removal.

(5) The Department may require Modification of the removal plan or require that the work performed under the plan be supervised by an Engineer. If the Department requires Modification of the removal plan or requires that work be supervised by an Engineer, the Department shall notify the Dam owner and provide an opportunity to meet with the Department.
(6) Upon completion of the Dam removal, the owner shall notify the Department. The Department shall make a final inspection, if appropriate, and remove it from Department Dam safety oversight.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.452, 540.488

690-020-0180
Requirement of Owners to Provide Contact and Transfer of Title Information
(1) If an Emergency Action Plan exists, a Dam owner shall provide the Department with contact information in the Emergency Action Plan consistent with OAR 690-020-0400, and notify the Department of any changes in contact information, including transfer of title for the Dam.
(2) If no Emergency Action Plan exists, a Dam owner shall:
(a) Provide the Department with contact information in writing for the Dam owner, the individual in immediate charge of the Dam, and the operator of the Dam, if other than the owner; and
(b) Notify the Department of any changes in contact information, including transfer of title for the Dam.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.479, 540.488

~~**690-020-0200**~~
~~**Fees for Dams**~~
~~(1) Dam owners subject to dam safety regulations shall submit to the Department an annual fee on the basis established under ORS 536.050(2).~~
~~(2) Dam owners who fail to pay an annual fee on or before six months after the billing date may be required to pay a late fee of $100.~~
~~(3) If a dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the dam owner notice by certified mail, place a lien on the real property where the dam is located for the fees owed by the dam owner.~~
~~(4) Multiple large dams connected together and separated only by embankments or other manmade materials (common with sewage lagoons) will count as one dam for fee purposes.~~
~~(5) The Department may use the dam safety fee to support dam safety inspections; conduct dam breach inundation analysis for existing dams; help dam owners complete emergency action plans for existing dams; conduct or support the technical analysis of the safety of specific dams; and other actions as needed to support the dam safety program.~~
~~**Statutory/Other Authority:** ORS 536.050~~
~~**Statutes/Other Implemented:** ORS 536.050~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~
~~WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10~~

690-020-0250
Maintenance of Dams

(1) The Dam owner shall review and evaluate conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, and address any detected conditions that may pose a risk of Dam Failure. ~~When inspecting dams to insure the safety of the dam, the Department may consider whether the dam owner has conducted routine maintenance on dams as follows:~~

(2) Proper maintenance includes but is not limited to:

(a) Removal of brush and trees from the Dam;

(b) Control of burrowing animals, especially nutria near the Dam or reservoir, including filling deep burrows;

(c) Restoration of areas of surface or wave erosion, and taking measures to prevent future erosion;

(d) Adding or moving fill to restore Crest Height and width;

(e) Clearance of soil, rock, vegetation and debris from the Spillway;

(f) Proper cycling and lubrication of Valves and Gates at least once a year, unless otherwise specified in a maintenance and operations plan approved by the Department;

(g) Patching, sealing, or replacing areas of cracked concrete on the Dam;

(h) Removal of debris, rock, or earth from the inlet and outlet of penetrating Conduits and drains;

(i) Repair or replacement of worn or damaged parts of Gates or Valves;

(j) Ensuring access to the Dam is sufficient for inspection, repair and emergency actions, and that unauthorized access is controlled;

(k) Securing operating equipment such as Valve controls and Spillway controls;

(l) Evaluation of the Conduit and taking necessary actions to ensure the Conduit is not compromised, including patching pipes with minor corrosion; and

(m) Addressing other conditions that might affect the safety of the Dam.

(3) Maintain records as needed to track conditions on the dam.

~~(a) Whether brush and trees have been removed and whether vegetation on the embankment or spillway has been mowed;~~

~~(b) Whether burrowing animals are controlled and animal burrows are filled;~~

~~(c) Whether surface erosion is effectively controlled;~~

~~(d) Whether freeboard and adequate crest width have been maintained;~~

~~(e) Whether the spillway is functioning correctly and that its capacity has not been reduced;~~

~~(f) Whether mechanical equipment has been properly cycled and lubricated;~~

~~(g) Whether cracked concrete structures have been properly patched, sealed, caulked or replaced to prevent deterioration;~~

~~(h) Whether debris, rock, or earth have been removed from outlet conduits, outlet channels or spillway channels;~~

~~(i) Whether worn or damaged parts of conduits, outlet valves or controls are in need of repair or replacement;~~

~~(j) Any other condition or activity that might affect safety of the dam.~~

~~(2) The Department may find that a dam is not safe if large trees or large woody vegetation exists on the dam.~~

~~(3) Maintenance deficiencies observed during periodic dam safety inspections shall be described in an inspection letter provided to the dam owner.~~
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.479, 540.488, 540.455~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0260
Inspection of Dams
(1) The Department or representatives of the Department, may inspect a Dam and the site, plans and specifications, features and other supporting information regarding the construction, maintenance and operation of a Dam.
(2) The Department will maintain a Dam inspection schedule based on the Hazard Rating of the Dam:
(a) High Hazard Dams are scheduled for inspection annually,
(b) Significant Hazard Dams are scheduled for inspection every 3 years, and
(c) Low Hazard Dams are scheduled for inspection every 6 years.
(3) Notwithstanding subsection (2), the Department may determine that a different inspection schedule is appropriate. The Department may consider staff resources and Dam risks or condition in determining that a different inspection schedule is appropriate.
(4) The Department shall provide the Dam owner with an inspection document describing the general condition of the Dam and specific maintenance recommended or Maintenance Actions required by the Department.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.479, 540.455, 540.467

~~**690-020-0300**~~
~~**Modification of Dams Requiring Notification and/or Approval**~~
~~(1) The activities described in OAR 690-020-0080(3) are considered such significant modification of the dam so as to constitute new construction requiring approval of engineered designs prior to initiating these activities.~~
~~(2) Any activity that will increase the volume or rate of water released during failure requires a new inundation analysis using methods described in OAR 690-020-0120 unless the dam is in a remote area with no downstream development or high recreational use areas that might be affected by a dam breach flood.~~
~~(3) Certain repairs that may affect the safety of the dam require on site analysis by an engineer during the actual repair process in order to determine the specific repairs needed. Prior approval of drawings for these repairs will not be required, as conditions encountered on site are likely to deviate from plans. Therefore, submission of an as-built drawing by the engineer of record of the following repairs indicating the repairs have been made correctly may be deemed as evidence of the safety of the dam:~~
~~(a) Slip lining of existing conduits that does not involve excavation into the dam and does not result in a significant reduction in the time required for the conduit to empty the reservoir;~~
~~(b) Replacement of toe drains; and~~

~~(c) Any other such repairs as determined by the State Engineer.~~
~~**Statutory/Other Authority:** ORS 540.350 - 540.400~~
~~**Statutes/Other Implemented:** ORS 183, 536 & 540~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~

690-020-0310
Maintenance Actions
(1) Upon inspection of a dam, the Department will determine the need for maintenance action to address conditions observed during an inspection and shall provide this information to the Dam owner in the inspection summary for low hazard dams. The Department shall use the process that follows for maintenance action on dams that are rated Significant or High Hazard.
(2) Upon inspection of a Dam that is rated as High or Significant Hazard, the Department shall provide specific written notice to the Dam owner describing the observed condition of the Dam and shall inform the Dam owner of necessary maintenance actions needed to correct maintenance deficiencies.
(a) The notification shall provide the Dam owner with the opportunity to meet with the Department concerning the information provided in the inspection notification. Upon request of the Dam owner, the Department may provide more specific information regarding the inspection and the maintenance needs of the Dam. In addition, the Department and the Dam owner may enter into a Stipulated Correction Plan that provides dates certain by which necessary maintenance actions are performed.
(b) The Department may evaluate whether maintenance was successfully completed during the next scheduled inspection of the Dam or the Department may expedite the Dam inspection schedule for the next inspection to determine whether recommended conditions have been completed.
(c) If upon inspection of the Dam the Department determines that the Dam owner has failed to take necessary maintenance actions as identified in the inspection notification or a Stipulated Correction Plan, the Department may proceed to issue a proposed final order as provided in OAR 690-020-0460. A proposed final order may include provisions including, but not limited to provisions:
(A) Requiring performance of the necessary maintenance requirements identified in the inspection notification by a date certain as specified by the Department;
(B) An assessment of civil penalties consistent with OAR 690-020-0600.
(d) At any time subsequent to receipt of a proposed final order, the Dam owner may enter into a Stipulated Corrective Plan to resolve the matters asserted in the proposed final order as provided in ORS 183.417. If the Dam owner performs needed maintenance actions to the satisfaction of the Department and consistent with the Stipulated Corrective Plan, the Director may not assess or pursue civil penalties for the matters identified in the Stipulated Corrective Plan.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.467

690-020-0340
Potentially Unsafe or Unsafe Conditions

(1) The Department shall determine whether a High or Significant rated Dam is potentially unsafe or unsafe after inspection or analysis of the Dam. Potentially unsafe or unsafe conditions must be addressed by any lawful remedy available to the Department including issuance of a proposed final order as specified in this rule.
(2) Potentially Unsafe conditions include, but are not limited to:
(a) Embankment materials highly vulnerable to internal erosion;
(b) Highly variable and increasing rates of seepage;
(c) Seismic analysis determines significant Crest loss with little Freeboard remaining;
(d) For Dams in high seismic zones, a layer of liquefiable materials in the Dam or its Foundation;
(e) Evidence of prior large rapidly moving landslides identified above the Dam;
(f) Spillways are unable to pass the Inflow Design Flood as stated in 690-20-0037 or Probable Maximum Flood; or
(g) Issues on the Spillway invert that could lead to rapid loss of Spillway integrity.
(3) Unsafe conditions include, but are not limited to:
(a) Any reduction in Spillway capacity;
(b) Movement of the Dam over a short period of time;
(c) Major loss of Freeboard;
(d) Wave erosion narrowing Dam Crest;
(e)Internal erosion with limited movement of Embankment material;
(f) Seepage level rising on the downstream face of the Dam;
(g) Landslide or other deformation on the Dam;
(h) Rapid erosion of the Spillway;
(i) Significant loss of mass of a concrete Dam;
(j) Concrete Spillway with large voids or openings through the slab;
(k) Conduit deteriorated to where Conduit collapse is reasonably possible;
(l) A Pressurized Conduit with holes in pipe;
(m) Flashboards in place during high runoff season;
(n) Animal burrows penetrating deep into the Dam;
(o) Large trees growing near the Crest of the Dam; or
(p) Any new Dam construction or construction of a Dam to increase Height in violation of requirements for examination and written approval of site plans, specification, and other supporting information for that Dam.
(4) Notification of Potentially Unsafe or Unsafe Conditions. If as a result of an inspection or analysis of a Dam that has a High or Significant Hazard rating the Department concludes that corrective action is necessary to address a condition rendering the Dam Unsafe or Potentially Unsafe, the Department shall provide written notification to the Dam owner by registered or certified mail, return receipt requested, sent to the address of record on file with the Department, as per OAR 690-020-0180, for the Dam owner.
(a) The written notification shall include at least the following:
(i) An explanation of why the inspection or analysis of information and conditions causes the Department to conclude that the Dam is unsafe or potentially unsafe;
(ii) Any action the Department concludes is necessary to address the unsafe or potentially unsafe conditions;

(iii) Notification to the Dam owner of the opportunity to meet with the Department to discuss the notification; and
(iv) Notification to the Dam owner of the opportunity to explain why the Dam owner disagrees with the matters asserted in the notification.
(b) Following issuance of a notification, the Department may endeavor to resolve the unsafe or potentially unsafe conditions identified in cooperation with the Dam owner. The Department and owner may enter into a consent order to address the corrective action, but only as such cooperation and agreement results in timely resolution of the unsafe or potentially unsafe conditions. In developing a consent order, the Department may consider any relevant information, including but not limited to:
(i) The design and construction of the specific Dam;
(ii) The efforts and resources of the Dam owner; and
(iii) The impacts associated with Dam failure.
(5) The Department may issue a Proposed Final Order in the event the Department and the Dam owner do not enter into a Stipulated Corrective Action agreement to address corrective actions, if the Dam owner fails to complete necessary actions as provided in the consent order, or in the event the Dam owner does not otherwise address the matters identified in the notification to the Departments satisfaction.
(a) The proposed final order shall include the specific information and conditions that have caused the Department to conclude that a Dam is unsafe or potentially unsafe, shall be consistent with ORS 183.415, and shall provide notice of the opportunity for a contested case hearing pursuant to ORS 183.
(b) The proposed final order may include, but need not be limited to any or all of the following provisions:
(i) Notifying the Dam owner what information and conditions caused the Department to determine that the Dam is unsafe or potentially unsafe and the actions the Department concludes are necessary to address the unsafe or potentially unsafe conditions.
(ii) A requirement that the Dam owner consult with an engineer to assess the nature and extent of the unsafe or potentially unsafe conditions identified by the Department and to identify corrective actions to address the unsafe or potentially unsafe conditions.
(iii) Commencement and completion dates for any corrective action the Department determines is necessary to remedy the unsafe or potentially unsafe conditions.
(iv) Restrictions on the maximum Water level in the reservoir until corrective action has been completed to the satisfaction of the Department.
(v) Provisions directing that the Dam may not used for the impoundment, restraint or conveyance of Water until corrective actions have been completed to the satisfaction of the Department.
(vi) Requirement to install and maintain monitoring equipment if the Department concludes that monitoring is necessary to protect life, property or public infrastructure. The provisions requiring the installation and use of monitoring equipment at a Dam to monitor the unsafe or potentially unsafe conditions shall include the ability to the use the most economical monitoring equipment which is sufficient to protect life, property and public infrastructure as determined by the Department.
(6) Upon issuance of a proposed final order, the Dam owner and Department may enter into a Consent order to resolve the matters in the proposed final order as provided in ORS 183.417.

Any such document must include conditions to address the matters in the proposed final order as determined by the Department.
(7) If following issuance of a proposed final order the Department receives a request for hearing from the Dam owner, the Director may request that the scheduling of any contested case hearing by expedited, and the Office of Administrative hearings shall expedite the contested case hearing to the extent that the office considers it practicable and will give the Dam owner reasonable time to prepare.
(a) In determining the expedited timeline practicable, the Office of Administrative Hearings shall consider, based on information provided by the Department, any conditions that may affect the urgency of the proceedings or the likelihood that unsafe or potentially unsafe conditions may pose near-term threat to life, property, or public infrastructure.
(8) Issuance of a proposed final order does not preclude the Department from pursuing any and all lawful remedies as the Department may determine are necessary to protect life, property or public infrastructure including but not limited seeking injunctive relief in the circuit court.
(9) In addition to any other available lawful remedies, if a proposed final order issued under this section becomes final by operation of law or on appeal, and the Dam owner fails to comply with the order as specified in the order, the Department may request the Attorney General or the district attorney of any county where all or part of the Dam is located to bring an action declaring the Dam a public nuisance and ordering its removal at the owner's expense.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Other Implemented: ORS 540.458, 540.461

~~**690-020-0350**~~
~~**Operations and Maintenance Plans**~~
~~(1) As part of the plans submitted with the design, the engineer of record shall provide to the Department operations and maintenance plans for new significant and high hazard dams, and for any new dam with a gate or flashboard as part of the spillway. The dam owner shall be responsible for implementation of operations and maintenance plans, and compliance with these may be reviewed during dam safety inspections.~~
~~(2) Operations and maintenance plans may include but are not limited to:~~
~~(a) Procedures for operation of all gates and valves;~~
~~(b) Specified frequency for cycling of the slide gate and/or valves;~~
~~(c) The time of year flashboards are allowed in the spillway;~~
~~(d) Removal of trees and shrubs, and mowing other vegetation as needed;~~
~~(e) Routine inspections, including evaluation of seepage flow, and visual identification of any turbid seepage;~~
~~(f) Water release plan in the event of a flood forecast when reservoir is above a certain level; and~~
~~(g) Measurement frequency for all monitoring instrumentation installed at the dam.~~
~~**Statutory/Other Authority:** ORS 540.350 - 540.400~~
~~**Statutes/Other Implemented:** ORS 183, 536 & 540~~
~~**History:**~~
~~WRD 2-2015, f. & cert. ef. 3-17-15~~

690-020-0400
Emergency Action Plans (EAP) ~~and Emergencies~~
(1) All High Hazard Dams shall have an Emergency Action Plan (EAP). The EAP is to assist the Dam owner and local emergency management personnel to ensure human safety in the event of a potential or actual Dam Failure. The final EAP, for new Dams or where Dam height is modified, must be reviewed and approved by the State Engineer.
(~~2~~1) A Draft EAP~~Emergency Action Plans are~~ is required prior to completion of new ~~d~~Dam construction~~. or modification as described in OAR 690-020-0300(1), and final EAP's must be submitted prior to filling the reservoir. The final emergency action plan must be reviewed and approved by the State Engineer. EAPs for dams constructed after March 2015 must be updated at least once every two years, including but not limited to ensuring all notification contacts are current.~~
(3) A final EAP must be submitted prior to filling a new reservoir. The final EAP must be reviewed and approved by the State Engineer.
(~~4~~2) Owners of Dam~~s owners are encouraged to complete emergency action plans for their existing~~ which have been reclassified to a ~~h~~High ~~h~~Hazard Rating~~dams~~ will be required to develop and submit an EAP within one year of being notified of the reclassification by the Department.
(~~5~~3) An EAP shall contain, as a minimum, the following key elements:
(a) Means for ~~E~~emergency condition detection;
(b) Means for ~~E~~emergency level determination;
(c) Identification of, and information necessary for, ~~N~~notification and communication to be made at ~~lists applicable to~~ each level of ~~the~~ emergency condition~~levels~~;
(d) Description of ~~Expected~~ actions to prevent a ~~d~~Dam ~~f~~Failure incident or to help reduce the effects of a ~~d~~Dam ~~f~~Failure and facilitate response to an emergency;
(e) A map of Dam Failure ~~I~~inundation zones developed using a Dam breach inundation analysis for varying conditions as specified by the Department, including, but not limited to, dry weather conditions and high flood conditions. The Department may require one inundation map if the dry weather and high flood flows are not substantially different. The inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section~~mapping that normally includes both a sunny day and a probable maximum flood failure~~; and
(f) Procedures for termination of the emergency.
(~~6~~4) The Dam owner~~s~~ shall file copies of the EAP with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located~~of high or significant hazard dams shall immediately notify the State Engineer of potential or actual dam failure situations~~.
(~~7~~5) The Department will, in consultation with the local Office of Emergency Management:~~Dam owners shall notify the State Engineer of any breach of any dam subject to these regulations.~~
(a) Periodically review the EAP and may require updates to the plan that recognize the actual capabilities of the local emergency managers, and
(b) Determine the appropriate frequency for conducting emergency response exercises.
(~~8~~6) In the event of an actual or potential Dam Failure which creates imminent ~~If the Department observes evidence of a dam at risk of imminent failure and a~~ risk to life, the Dam owner shall

immediately implement the actions specified in the EAP~~or property, local public safety officials shall be notified of the situation~~.
Statutory/Other Authority: ORS 536.027, 540.488~~540.350 - 540.400~~
Statutes/Other Implemented: ORS 540.482, 540.485~~183, 536 & 540~~
History:
WRD 2-2015, f. & cert. ef. 3-17-15

690-020-0410
Emergency Actions for Significant Hazard Dams
If an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure, and no EAP exists for the Dam, the Dam owner shall immediately:
(1) Notify the local emergency services agency, the Department, and Persons in areas where the potential for Dam Failure creates risk to life, property, or public infrastructure by telephone or other methods that ensure immediate notification, and
(2) Take all practicable actions to prevent Dam Failure.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Others Implemented: ORS 540.482, 540.485

690-020-0420
Immediate Action to Prevent Dam Failure
(1) If an actual or potential failure creates an imminent risk to life, property or public infrastructure and an Emergency Action Plan exists for that Dam, a Dam owner must immediately implement the actions specific in that plan.
(2) If no emergency plan exists, and an actual or potential failure creates an imminent risk to life, property or public infrastructure, the Dam owner shall immediately notify by telephone or other method that ensures immediate notification:
(a) For Dams rated High or Significant Hazard, the local emergency services agency for the county where the Dam is located;
(b) The Department; and
(c) To the extent practicable, persons in the area where the potential for Dam failure creates a risk to life, property or public infrastructure.
(3) In addition to providing notification as described in this rule, a Dam owner must also take any and all practicable measures to prevent Dam failure.
(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, it may take any immediate action to prevent failure of the Dam. The Department may:
(a) Immediately contact and advise the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure;
(b) If a Dam has a Significant or High Hazard rating, the Department or its agents and representatives may enter the property without notice or permission of the pertinent landowner to access the Dam and evaluate the condition or risk or to undertake necessary actions. The Department's entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary.

(c) If the Department observes that there is a rapidly increasing leakage risk of overtopping at a Dam that has a Significant or High Hazard rating, the Department may perform any or all of the following actions:
(A) Open Gates or Valves and siphon or pump Water to reduce the Water levels of the reservoir;
(B) Modify approval requirements for emergency construction work;
(C) Allow Modification of the actions prescribed in the Emergency Action Plan; and,
(D) Pursue any other lawful remedy.
Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Others Implemented: ORS 540.482, 540.485

690-020-0460
Proposed Final Order, Request for Hearing, Contested Case Process
(1) Proposed Final Order, Notice of Assessment of Civil Penalty. A proposed final order or Notice of Assessment of Civil Penalty must be consistent with the provisions of ORS 183.415, shall include notification of the right to a contested case hearing pursuant to ORS 183, and shall include any applicable or required element otherwise specified in the Dam safety rules governing proposed final orders. A proposed final order or Notice of Assessment of Civil Penalty must be served personally or by registered or certified mail.
(2) Request for a Hearing. A Dam owner that receives a proposed final order or a Notice of Assessment of Civil Penalty has 20 calendar days from the date of service of the proposed final order in which to file a written request for hearing. The request for hearing must be filed either in person or by mail addressed to the Department's office in Salem, Oregon. The request for hearing may not be considered timely filed unless it is received in the Department consistent with this subsection. The request for hearing must include a written response that admits or denies all factual matters alleged in the notice, and must state with specificity the reasons for disagreement with the proposed final order.
(3) Contested Case Procedure. Contested case hearings resolving requests for hearing to proposed final orders issued by the Department under these rules shall be heard by administrative law judges from the Office of Administrative Hearings. Hearings shall be conducted as provided in ORS 183 and the Attorney General's Uniform and Model Rules of Procedure under the Administrative Procedures Act in OAR 137-003-501 - 0700 except:
(a) Only a Dam owner or the Dam owner's authorized representative may request a contested case hearing and be considered a party in any contested case.
(b) For expedited contested case hearings regarding proposed final orders addressing unsafe or potentially unsafe conditions, discovery methods as provided in OAR 137-003-0566 shall not be allowed because the availability of other forms of discovery would unduly delay proceedings to address conditions that address a near-term risk of threat to life, property or public infrastructure. Notwithstanding, a party may request public documents pursuant to a request for public records made to the Department as described in OAR Chapter 690 Division 3.
(c) Immediate review under OAR 137-003-0640 is to the Director only.
(4) Proposed Order in Contested Case. Following the close of the record for a contested case hearing, the administrative law judge will issue a proposed order and shall serve the proposed order on each participant to the contested case.

(5) Exception to Proposed Order. If the recommended action in the proposed order is adverse to any party the party may file written exceptions to the Department within 15 days after a proposed order is served.
(6) Final Order. The Director may consider any exceptions received and shall issue a Final Order as provided in OAR 137-003-0665. An order adverse to a party may be issued upon default as provided in OAR 137-003-0672.
(7) The Department and a Dam owner may at any time use informal or alternative means to resolve a contested case hearing. When informal disposition of a contested case is made by stipulation, agreed settlement or consent order, the final order that incorporates the informal disposition is not subject to judicial review.
Statutory/Other Authority: ORS 536.027, 540.488, 183
Statutes/Others Implemented: ORS 183, 540.461, 540.467, 540.488, 540.995, 540.458

~~**690-020-0500**~~
~~**Enforcement**~~
~~(1) When any dam is found to be in violation of the terms and conditions of the water right permit or certificate, or directly threatens life or property, or when any structure is found where lack of maintenance or unauthorized alterations could lead to a direct threat to life or property, the Department shall notify the owner in writing of the violation and the action necessary and specified time allowed to bring the structure up to design, operation, or maintenance standards.~~
~~(2) Failure by the owner to perform the required action may result in proceedings for one or more of the following:~~
~~(a) Notice and opportunity for a contested case hearing as provided for in ORS 540.350(5).~~
~~(b) Posting of the structure to prevent storage or to limit operation until the owner has complied with the requested action required to fulfill conditions of the permit or certificate.~~
~~(c) Instituting legal action by the District Attorney or Attorney General to have the facility declared a public nuisance.~~
~~(d) Issuance of an order to prevent storage or to breach the embankment as provided for in ORS 540.370.~~
~~(e) Any other enforcement action permitted by law.~~
~~(3) Engineering work that is inconsistent with any rules in this Division may be referred to the Oregon State Board of Examiners for Engineering and Land Surveying, for appropriate actions.~~
~~**Statutory/Other Authority:** ORS 540.350 - 540.400~~
~~**Statutes/Other Implemented:** ORS 183, 536 & 540~~
~~**History:**~~
~~Renumbered from 690-020-0050, WRD 2-2015, f. & cert. ef. 3-17-15~~
~~Renumbered from 690-020-0039, WRD 7-2009, f. 12-7-09, cert. ef. 1-1-10~~
~~WRD 12-1986, f. & ef. 10-3-86~~

690-020-0600
Civil Penalty Assessment for Dam Safety
(1) The Department may assess civil penalties for the following violations:

(a) Construction of a Dam without prior written approval from the Department of the final Dam design, construction documents and operation documents as described in 690-020-0080(1) and 0140 (1);
(b) Impoundment of Water behind a Dam before final documentation has been submitted and accepted by the Department as provided in in 690-020-0080 (4) and 0150(6);
(c) Beginning construction to remove a High or Significant Hazard Rated Dam rated as High or Significant Hazard prior to providing notice to the Department, as provided in 690-020-0160;
(d) Failure to file an Emergency Action Plan with the Department, Office of Emergency Management, and the local emergency services agency for the county where the Dam is located, as provided by 690-020-0400;
(e) Failure to complete needed Dam Maintenance Actions on a High or Significant Hazard Dam, as described in 690-020-0310.
(2) The civil penalty for beginning construction of a Dam prior to obtaining written approval from the Department of final Dam design, construction, and operation documents prior to Dam construction activity shall be $2000 for a High Hazard Rated Dam, $1,000 for a Significant Hazard Rated Dam; and $500 for a Low Hazard Rated Dam.
(3) The civil penalty for impounding Water prior to submission and acceptance by the Department of the final plans and specifications shall be $1000 for a High Hazard Rated Dam, $500 for a Significant Hazard Rated Dam; and $250 for a Low Hazard Rated Dam.
(a) A civil penalty may be assessed for each day of violation for the period the reservoir is impounding Water until satisfactory completion documents are accepted, or until the reservoir is emptied, whichever is sooner.
(b) The Department may remit all or a portion of a civil penalty if completion documents existed but were not submitted, and those documents meet the criteria, or for Dams which are modified to be exempt from Dam safety requirements as per ORS 540.446 (1)).
(4) The civil penalty for beginning construction work to remove a Dam rated as High or Significant Hazard prior to submission and acceptance of a Dam removal plan, failure to modify the plan if required, or failure to follow the modified plan shall be $2000 for a High Hazard Rated Dam and $1000 for a Significant Hazard Rated Dam
(a) A civil penalty may be imposed for each day of violation beginning on the day removal activities began until the Dam is no longer storing Water and construction work to remove the Dam has ceased.
(b) The Department may remit all or a portion of this civil penalty if the Department receives and accepts a Dam removal plan and determined the Dam removal was consistent with the plan and completed safely with no downstream damage.
(5) The civil penalty for failure to file an Emergency Action Plan for a High Hazard Rated Dam with the Department, Office of Emergency Management, and the local emergency services agency for the county where the Dam is located shall be $2000.
(a) A civil penalty may be imposed for each month of violation beginning on the date the notice of violation was first provided to the responsible party.
(b) The Department may remit all or a portion of the civil penalty if development of the plan is underway and the plan is submitted within 60 days of the due date.
(6) The civil penalty for failure to complete needed Maintenance Actions identified in a prior inspection document for Dams rated as High or Significant Hazard shall be:

(a) A civil penalty of $500 may be assessed for failure to perform required Maintenance Action(s) on a High Hazard Rated Dam which could result in the Dam becoming Unsafe. Each month will constitute a new violation until the required Maintenance Action(s) are completed;
(b) A civil penalty of $250 may be assessed for all other required Maintenance Actions. Each month will be considered a new violation until the required Maintenance Action(s) are completed;
(c) A civil penalty of $250 may be assessed for failure to perform required maintenance on a Significant Hazard Rated Dam which could result in the Dam becoming Unsafe. Each month the violation continues will be considered a new violation;
(d) A civil penalty of $150 may be assessed for failure to complete all other required maintenance for a Significant Hazard Rated Dam. Each month that the required Maintenance Action(s) is not completed will be considered a new violation; and,
(e) The Department may remit all or a portion of a Civil Penalty if the Dam owner voluntarily complies with a schedule of repairs that allows necessary engineering or inspection expertise to address the maintenance issue, or allows for work during more favorable and safe weather conditions.

Statutory/Other Authority: ORS 536.027, 540.488
Statutes/Others Implemented: ORS 540.467, 540.482, 540.488, 540.449, 540.452

CHAPTER 690
DIVISION 20
Dam Safety

690-020-0000
Purpose and Applicability

(1) The purpose of these ~~Division 20~~ rules is to implement ORS 540.443 through 540.491 and ORS 540.995, as well as applicable sections of ORS 536.050 and ORS 537.400, ~~with~~ through actions that are intended to ensure the safety of the Dams, insofar as Dams may affect possible loss of life or property, and damage to public infrastructure. Prioritization of Dam safety actions and requirements are based on the Hazard Rating of the Dam. These rules outline processes to:

(a) Review design and specifications to Construct a Dam;

(b) Review plans for ~~r~~Removal of Significant Hazard and High Hazard Dams;

(c) Conduct routine inspections and notify Dam owners of outcomes;

(d) Cooperate with Dam owners over Dam safety issues;

(e) Prescribe Maintenance Actions, corrective actions, or any other actions necessary to protect life, property, or public infrastructure consistent with the Department's authorities and with law, and to pursue formal enforcement as necessary;

(f) Communicate, coordinate, and collaborate with Persons, Tribes, or other government entities regarding Dam safety; and

(g) Plan for and respond to emergencies as necessary and as consistent with law.

(2) These rules do not apply to:

(a) Dams that are less than ten feet in Height or that impound less than three million gallons (9.2 Acre-feet) of Water;

(b) Water storage Tanks or various types of Tanks that are part of Water treatment facilities; and

(c) Dams regulated under a federal Dam safety program, except as provided in ORS 540.446 and OAR 690-020-0024.

(3) Compliance with ORS 540.443 through 540.491 and these OAR Chapter 690, Division 20 rules does not relieve the owner or operator of a Dam or an individual in immediate charge of a Dam from

any duty, obligation, or liability regarding the ownership, maintenance, or operation of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 536.050, 537.400, 540.446, 540.488, 540.491

690-020-0022
Definitions
Unless the context requires otherwise, the following definitions apply in OAR Chapter 690, Division 20:

(1) "Abutment" means a natural valley or canyon side against which the Dam is built;

(2) "Acre-~~F~~feet" means the unit of volume equal to one acre covered with one foot of Water (325,851~~900~~ gallons);

(3) "Annual Exceedance Probability Flood" means the likelihood of a specific flood flow being equaled to or exceeded in any given year at that specific location, expressed as a percentage;

(4) "As-built Drawing" means an engineering drawing of a Dam as it was actually constructed, noting all differences between original design and actual constructed condition;

(5) "Conduit" means a closed conveyance used to release Water through a Dam;

(6) "Core" means a soil of low permeability within an Embankment Dam;

(7) "Construct" has the meaning given to the term in ORS 540.443;

(8) "Constructing" has the same meaning as "Construct";

(9) "Crest" means the top of the Dam;

(~~8~~10) "Cutoff Trench" means a trench excavated beneath the Dam Foundation and backfilled with low permeability material to retard Water seepage;

(~~9~~11) "Dam" has the meaning given to the term in ORS 540.443;

(12) "Dam Failure" has the meaning given to the term in ORS 540.443;

(13) "Department" means the Oregon Water Resources Department;

(14) "Director" means the Director of the Oregon Water Resources Department;

(15) “Embankment” means an engineered earth fill;

(16) “Emergency Action Plan” or “EAP” has the meaning given to the term in ORS 540.443;

(17) “Engineer” means an individual who is registered in this state and holds a valid certificate to practice engineering in this state as provided under ORS 672.002 to 672.325;.

(18) “Engineer of Record” means a professional engineer registered in Oregon retained by a Dam owner to analyze, plan, and design a Dam to current safety standards, to oversee safe construction of a Dam, to supervise Modification or rRemoval of a Dam, or to oversee corrective actions identified by the Department, or to otherwise administer activities for a Dam;

(19) “Foundation” means the ground surface upon which a Dam is constructed;

(20) “Freeboard” means the vertical distance between the high-water level in the reservoir and the low spot on the Dam Crest;

(21) “Gate” or “Valve” means a permanent device for regulating Water flow through the Dam;

(22) “Hazard Rating” means the categorization of a Dam established by the Department based on the potential damage to life, property, or public infrastructure downstream of a Dam in the event of a Dam Failure;

(22) “Height” means the maximum height of the Dam above natural ground as measured at the maximum section along the Dam’s longitudinal axis;

(23) “High Hazard Rating” or “High Hazard” has the meaning given to the term in ORS 540.443;

(24) “Inflow Design Flood” or “IDF” means the peak flood flow that the Engineer of Record will design to safely pass over or through the Spillway;

(25) “Low Hazard Rating” or “Low Hazard” means that if a Dam were to fail, loss of life would be unlikely, and damage to property or public infrastructure would not be extensive;

(26) “Maintenance Action” has the meaning given to the term in ORS 540.443;

(27) “Modification” means changes to a Dam which that have a potential impact on the safety of the Dam safe functioning of the dam, and also do not conform to the original designare to an extent that the modified dam structures no longer conform to the original design, but and do not include changes tomodifying Dam Height, performing Maintenance Actions, or removing a DamRemoval of a Dam;

(28) “Person” has the meaning given to the term in ORS 536.007;~~includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, the federal government and any agencies thereof; Tribe(s) and tribal members;~~

(29) “Potentially Unsafe” has the meaning given to the term in ORS 540.443;

(30) “Pressurized Conduit” means any pipe that penetrates into a Dam so that there is hydrostatic pressure due to the location of a Gate, Valve, or pipe connection;

(31) “Probable Maximum Flood” or “PMF” means the largest flood that could occur at a specific location, determined by the most severe set of atmospheric, soil moisture, and snowpack conditions that are reasonably possible at that location;

(32) “Removal” means demolishing all, or a portion of, the Dam structure permanently preventing storage of Water and allowing safe and natural passage of flood flows downstream;

(~~32~~33) “Significant Hazard Rating” or “Significant Hazard” has the meaning given to the term in ORS 540.443;

(~~33~~34) “Soil Filter” means soil with a gradation designed to inhibit movement of adjacent, finer grained soils;

(~~34~~35) “Spillway” means any structure constructed to bypass Water, including flood waters, to prevent Water overtopping the ~~Dam~~ Crest;

(~~35~~36) “State Engineer” means an Engineer employed by the Department that is either the director or a principal assistant working for the director as described in ORS 536.032;

(~~36~~37) “Tank” means a fully-enclosed (bottom and sides) hydraulic structure made from metal, reinforced concrete, rigid fiberglass, or plastic that provides its own Water-sealing and structural stability;

(~~37~~38) “Toe Drain” is a drainage structure designed to collect and remove seepage Water from the toe of the Dam and to discharge this Water in a manner where it can be measured;

(~~38~~39) “Unsafe” has the meaning given to the term in ORS 540.443;

(~~39~~40) “Water” means water or wastewater;

(~~40~~41) “Zoned Embankment” means an Embankment Dam with a Core of low permeability materials,

Soil Filter materials, drainage, and other materials placed to improve performance and safety of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443

690-020-0024
General Department Authorities and Intergovernmental Coordination
In addition to any other powers of the Department, in carrying out its duties, functions, and powers, under these rules and ORS 540.443 through 540.491 and 540.995, the Department may:

(1) Enter into contracts, memorandums of understanding and intergovernmental agreements for the inspection, evaluation or study of Dams, or the response to Dam Failure or potential Dam Failure.

(2) Accept moneys from any public or private source for the administration and enforcement of ORS 540.443 through 540.491 and these Division 20 rules for enhancing the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.

(3) Coordinate with federal, Tribal, state, local, and private entities to enhance the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.

(4) Waive or reduce fees for Dams inspected by another state agency under a memorandum of understanding with the Department.

(5) Aid in the inspection of a Dam and provide advice and assistance to prevent, mitigate, or respond to a potential or actual Dam Failure if there is a potential or actual risk of Dam Failure at a Dam regulated under a federal Dam safety program.

(6) Accept the reports of consulting Engineers, engineering geologists or other specialists employed by the Dam owner.

(7) Employ consulting Engineers, engineering geologists, or other specialists to make special examinations and inspections, and to prepare reports for the Department if the Department concludes that existing reports are insufficient. The cost of such special examinations, inspections, and reports shall be paid by the Department, or upon mutual agreement, may be divided between the Department and the Dam owner.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488~~, 536.027~~
STATUTES/OTHER IMPLEMENTED: ORS 540.446~~488~~, 540.464~~446~~, 540.488~~464~~

690-020-0026

Fees
(1) The Department may charge a fee for examination of the site, plans and specifications, features, and other supporting information regarding construction of a new Dam or construction to modify Dam Height. The fee, as provided in ORSD 540.449 Oregon Laws 2019, must be paid prior to final design approval and may not exceed the lesser of the costs of providing the examination or the amounts provided in ORS 540.449 (3).

(2) Dam owners subject to the Department's laws governing Dam safety shall submit to the Department an annual fee based upon the Dam's Hazard Rating as provided in ORS 536.050 (2) to support the Dam Safety Program and administration expenses.

(a) Dam owners who fail to pay the annual fee on or before six months after the billing date may be required to pay a late fee as provided in ORS 536.050 (2).

(b) If a Dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the Dam owner notice by certified mail, place a lien on the real property where the Dam is located for the fees owed by the Dam owner.

(c) Multiple Dams directly adjacent to each other and connected together and separated only by Embankments or other manmade materials will be considered as one Dam for the purpose of determining annual fees.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 536.050, 540.449, 536.050

690-020-0028
Preliminary Plans and Specifications for Construction of New Dams or to Increase Dam Height
(1) If a Dam requires a Water right, preliminary plans and specifications must be submitted to the Department at the time an application to appropriate Water is submitted to the Department pursuant to ORS 537. Preliminary plans and specifications are recommended for Dams that do not require a Water right.

(2) Preliminary plans and specifications must include the following at a minimum:

(a) A contour map of the reservoir site showing the proposed location of the Dam. The map should be no smaller than 11"eleven inches by X 17"seventeen inches. The map must show the proposed location of the Spillway(s) and the Conduit inlet and outlet;

(b) Written description of the proposed Dam location both as Latitude/Longitude and Township/Range/Section;

(c) A cross section of the proposed Dam at the maximum section indicating the proposed Height;

(d) The proposed storage of the reservoir in Acre-~~F~~feet; and

(e) A brief description of geologic conditions of the proposed site. Any geologic features that could impact the safety of the Dam should be clearly described.

(3) The preliminary plans and specifications must be submitted by an Engineer, or a certified engineering geologist that is registered in the State of Oregon and is also a Certified Water Rights Examiner.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 537.400

690-020-0035
Minimum Engineering Requirements for Final Design of New Dams or to Increase Dam Height
~~(1) No Person may build a new Dam or increase Dam Height unless the Department has first examined the site, plans and specifications, features, and other supporting information as prepared by an Engineer regarding the construction and operation of the dam.~~

(~~2~~1) Final documents must be submitted by the Engineer of Record prior to construction to ~~construction~~build a new Dam or increase Dam Height as required in OAR 690-020-0080. Design reports may be completed by Engineers other than the Engineer of Record. If multiple reports are submitted, each must be stamped by the Engineer who prepared the report.

(~~3~~2) Final documents shall include:

(a) A plan for construction administration as provided in OAR 690-020-0065;

(b) An operations and maintenance plan if required by OAR 690-020-0350;

(c) An Emergency Action Plan for Dams rated High Hazard as provided in OAR 690-020-0400;

(d) Final design drawings as provided in OAR 690-020-0055; and

(e) Final design reports.

(~~4~~3) The final design report(s) must include the following elements:

(a) Site suitability evaluation as provided in OAR 690-020-0036;

(b) Hydrology and Inflow Design Flood as provided in OAR 690-020-0037;

(c) Dam structure design as applicable and as provided in OAR 690-020-0038 ~~–~~ 690-020-0041;

(d) Spillway design as provided in OAR 690-020-0042;

(e) Design for penetrating Conduit(s) as provided in OAR 690-020-0043;

(f) Monitoring and instrumentation for determining whether a Dam is operating properly based on the Hazard Rating of the Dam as provided in OAR 690-020-0044; and

(g) A Dam Breach Inundation Analysis as provided in OAR 690-020-0120.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0036
Design Requirements for New Dams or to Increase Dam Height: Site Suitability and Geotechnical Evaluation

The design ~~for construction of~~to build a new Dam or to increase Dam Height shall characterize the soil and rock at and around the Dam site and shall include the following elements:

(1) A description of the general and local geology and geomorphology at and around the proposed Dam and reservoir site~~:~~;

(a) Field investigation by a geotechnical Engineer or engineering geologist or both is required for ~~d~~Dams rated High Hazard. For ~~d~~Dams rated Significant Hazard, field investigation by a geotechnical engineer or engineering geologist or both is required where landslides, faults, dispersive soils, or liquefiable soils could reasonably be expected near or at the Dam site. All such features shall be shown on a map of the Dam site and be described as necessary for design of the Dam~~:~~;

(b) For Dams on located on rock, a drawing must also contain mapping of discontinuities relevant to the safety of the Dam and include evaluation of whether grouting is required;

(2) A subsurface investigation to determine the distribution of relevant earth materials, which shall include borings or test pits; identification of springs, seeps, and groundwater encountered at the Dam site; and evaluation of the potential for landslides into the Dam or reservoir;

(a) All materials shall be logged by the Unified Soil Classification System; blow counts (for borings only); and include a description of samples taken for testing~~:~~;

(b) Subsurface investigations for High Hazard Dams shall include drilling to a minimum depth of 1.5 times the Dam Height or at least ten feet into bedrock, whichever is less;~~.~~

(3) An evaluation of soil and rock and the testing of relevant materials, which may include: proctor compaction testing from all borrow areas, estimation or testing the permeability of soils to be used in Dam construction, and an assessment for the presence of dispersive soils. There must be a sufficient number of tests to characterize the variability in each borrow area. In addition, an evaluation must contain the following information as applicable and as may be required by the State Engineer:

(a) An analysis of materials in the Foundation and proposed Embankment if materials are prone to liquefaction or significant settlement;~~.~~

(b) Where suitable materials can be collected, strength tests shall be required for all High Hazard Dams, and may be required by the State Engineer for Significant Hazard Dams;~~.~~

(c) Testing of dynamic soil properties may be required for High Hazard Dams in areas with large ground acceleration potential from earthquake loading, if soils have potential for significant strength loss upon seismic loading;~~.~~

(4) Borrow area locations. Areas proposed for borrow shall be identified and shown on the drawings;

(5) Earthquake considerations. Seismic site characterization is required for High Hazard Dams, and may be required for Significant Hazard Dams. A seismic site characterization shall include earthquake sources, ground motion hazard, peak ground acceleration, and recommended ground motions (time histories); and

(6) Site preparation criteria. The site evaluation shall recommend a depth of stripping unsuitable materials, and also a minimum, and where necessary, maximum depth for the Cutoff Trench.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0037
Design Requirements for New Dams or to Increase Dam Height: Hydrology and Inflow Design Flood

The design ~~for construction of~~to build a new Dam or to increase Dam Height shall characterize flow into and through the reservoir and the Dam and shall include the following elements:

(1) A topographic map delineating the drainage area contributing to the Dam, with the drainage area size labeled in square miles and showing the specific location of the proposed Dam;

(2) For Dams on stream channels, the name of the stream where the Dam is located, the name of the principal watershed, and a determination of average annual inflow into reservoir and potential to fill the reservoir;

(3) The Inflow Design Flood that is the basis of hydraulic design for the Dam shall be determined based on the Hazard Rating of the Dam as follows:~~;~~

(a) The Inflow Design Flood for a High Hazard Dam is the Probable Maximum Flood (PMF) unless the Engineer of Record proposes to determine an Inflow Design Flood based on a quantitative analysis of risk to people;~~,~~

(b) The minimum Inflow Design Flood for a Significant Hazard Dam is the 0.2 percent Annual Exceedance Probability Flow;~~,~~

(c) The minimum Inflow Design Flood for a Low Hazard Dam is a 1.0 percent Annual Exceedance Probability Flow;~~,~~

(d) The Inflow Design Flood for a lagoon or off channel reservoir is the maximum capacity of inflow pumps or ditches plus the maximum local storm precipitation over the lagoon; and

(e) For watersheds under 30 ~~thirty~~ square miles, the Engineer of Record may consider just the 24-hour storm to help determine the PMF, while for larger basins the Engineer of Record shall utilize at least a 72-hour storm for calculating the PMF for a general storm;~~,~~

(4) Designs shall include a description of all hydrologic parameters and the method used to determine the Inflow Design Flood hydrograph and the volume of the Inflow Design Flood, which is to be determined considering basin size and other factors as appropriate to the watershed above the Dam; and

(5) The design report must include the information used to develop the stage and storage capacity curve for the reservoir, including the capacity with and without excavation for construction.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0038
Design Requirements for New Dams or to Increase Dam Height: Embankment Dam Structures
Designs ~~for construction of~~to build a new Dam or to increase Dam Height for Embankment (soil or rock) Dams shall include the following elements:

(1) A determination of Embankment stability and stable Embankment slope angles as follows:~~;~~

(a) Embankment Dams shall be designed to have stable slopes during construction, and under all conditions of reservoir operation;~~.~~

(b) Standard slopes of 3:1 upstream and 2:1 downstream may be used at the discretion of the Engineer of Record for Low and Significant Hazard Dams as long as low strength materials are not used in the Embankment and conditions leading to elevated pore Water pressures are not present;~~.~~

(c) For High Hazard Dams, an analysis of static and seismic slope stability, and of deformation. The State Engineer may require static and seismic slope stability analysis for Significant Hazard Dams. At a minimum, seismic analysis shall be based on full reservoir under steady state seepage conditions. Factors of safety shall be evaluated by slope stability analyses using appropriate strength parameters based on laboratory or in situ testing. For materials that can be reasonably tested either on site or in a laboratory, soil strength values may not be based on assumptions and must be made on strength testing of the appropriate soil or rock units;~~.~~

(d) High Hazard Dams shall be designed for the maximum credible earthquake. If the State Engineer requires seismic analysis of a Significant Hazard Dam, deformation analysis shall be designed for the 0.2 percent Annual Exceedance Probability earthquake; and

(e) Abrupt changes in depth of compressible Foundation material shall be identified and where present, the design shall prevent significant differential settlement;~~.~~

(2) Analysis of seepage and leakage expected through the Dam and design of measures to prevent internal erosion and excess leakage as follows:~~;~~

(a) Steady state seepage and internal drainage conditions beneath, around, and through the Dam shall be quantified for all High Hazard Dams, and may be required by the State Engineer for Significant Hazard Dams;

(b) A Core of low permeability material protected by a Soil Filter is required for all High Hazard Dams. A Core and Soil Filter is required for any Significant Hazard Dams where the Engineer of Record or State Engineer determines piping could potentially occur. All Core and filter zones must be of a configuration with dimensions that can be readily constructed;

(c) Internal drains and Soil Filters shall be used as needed to drain Water and prevent internal erosion of the Dam. Toe Drains shall be standard design practice for Water storage Dams, but not for most wastewater lagoons; and

(d) Internal drain pipes to collect and distribute seepage flows from internal filters and drains shall be comprised of material that is non-corrodible, designed to carry the overburden load, and be no smaller

than six~~6~~ inches in diameter;~~.~~

(3) A safe and accessible ~~Dam~~ Crest as follows:~~;~~

(a) The ~~Dam~~ Crest shall be of sufficient width to be accessible by equipment and vehicles for emergency operations and maintenance, and shall have a road to allow Crest access during periods when the Spillway is flowing;

(b) The Crest shall have a camber sufficient to maintain the design Freeboard, based on the anticipated Crest settlement, and in no case shall the camber be less than 0.5 feet;

(c) Roads located on the ~~Dam~~ Crest shall have appropriate surfacing to provide a stable base that resists rutting and provides adequate traction for access and safety in wet conditions; and

(d) The Crest shall have adequate cross slopes to prevent ponding;~~.~~

(4) Measures to control wave and surface erosion as follows:~~;~~

(a) For reservoirs large enough to generate significant waves, the design shall include a determination of minimum Freeboard based on expected waves. The design shall also include slope protection for wave action if significant waves are likely; and

(b) The downstream slope shall be provided with non-woody vegetative cover, or a gravel or rock surface, to prevent surface erosion.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0041
Design Requirements for New Dams or to Increase Dam Height: Concrete Dam Structures
Designs to build ~~for construction of~~ a new Dam or to increase Dam Height for concrete mass Dams must be prepared by a structural Engineer and a geotechnical Engineer or engineering geologist. This rule does not apply to concrete flashboard Dams. Designs for all other concrete Dams shall include the following elements as applicable:

(1) Concrete Dams shall be specified as gravity, arch, arch-gravity, or buttress. Gravity Dams can be of conventional mass concrete or roller compacted concrete;

(2) Dams shall be designed to be stable during construction and under all conditions of reservoir operation;

(a) Headwater and tailwater elevations pertinent to the design shall be described with respect to both static and dynamic loading;

(b) Uplift pressure distributions assumed for design shall be provided; and

(c) When Foundation drains are used to reduce uplift, the assumed drain efficiency shall be indicated and permanent access shall be provided at the project to inspect and maintain the drains;~~.~~

(3) Sliding stability shall be evaluated at lift joint surfaces, at the Dam Foundation interface, and at discontinuities in the Foundation materials beneath the Dam and Abutments;

(a) Factors of safety shall be based on limit equilibrium methods;~~.~~

(b) For earthquake loadings, a permanent sliding displacement may be determined in lieu of a sliding factor of safety; and

(c) Overturning of the Dam on its Foundation shall be evaluated for static and seismic loading;~~.~~

(4) Seismic stability analysis may be required for Concrete Dams and if required shall demonstrate the Dam can withstand the design earthquake without loss of life or damage to property or public infrastructure;

(a) High Hazard Dams shall be designed for the maximum credible earthquake based on current information from the US Geological Survey or a site specific seismic evaluation. A dynamic stress analysis that considers the dynamic characteristics of the Dam and the ground motions of the design earthquake shall be provided for High Hazard Dams; and

(b) Where the State Engineer requires seismic analysis on Significant Hazard Dams, they shall be designed for the 0.2 percent Annual Probability of Exceedance earthquake. The Department may require a dynamic stress analysis for Significant Hazard Dams;~~.~~

(5) When Foundation grouting is needed, the design for the grout curtain and consolidation grouting of the Foundation shall be described;

(6) Any property essential for the structural design of the concrete shall be included in the design documents. These may include, but are not limited to, compressive strength (at 28~~twenty-eight~~ days and one ~~-~~year), modulus of elasticity, Poison's ratio, shear strength, tensile strength, volume change during drying, thermal coefficient of expansion, specific heat, thermal conductivity, permeability and durability;

(a) As a minimum for static loadings, the assumed compressive and shear strengths for the parent

concrete, lift joint surfaces, and the Dam Foundation contact shall be provided;.

(b) In addition, tensile strength assumptions for the aforementioned regions for dynamic loadings (seismic) shall also be provided; and

(c) Air entraining agents shall be provided in the concrete mix to provide freeze-thaw protection and to improve the workability of lean mass concrete mixes. The quantity of air entrained in mass concrete shall be in the order of five percent;.

(7) Mix design and construction methods used to minimize cracking due to temperature gradients between interior regions subject to heat of hydration effects and surfaces exposed to ambient temperatures shall be specified. Treatment of lift joint surfaces to achieve desired shear and tensile strengths shall be indicated. Treatment of contraction joints to prevent leakage or to transfer load between adjacent monoliths shall be described;

(8) When reinforcing steel is used, the strength properties of the reinforcement shall be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements; and

(9) The minimum Crest width must be 15fifteen feet unless otherwise approved. The Dam Crest and appurtenant structures shall be accessible by equipment and vehicles for emergency operations and maintenance.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488, 540.449

690-020-0042
Minimum Design Requirements for New Dams or to Increase Dam Height: Spillways
(1) Dams on stream channels and all High Hazard Rated Dams must have a Spillway.

(2) Spillway(s) design for construction ofto build a new Dam or to increase Dam Height shall include the following minimum elements:

(a) Utilization of Inflow Design Flood. Determination of Inflow Design Flood as described in OAR 690-020-0037 is required to determine the required Spillway capacity;.

(b) Hydraulic evaluation of flow through control section. Flood flow through the control section must be calculated and the minimum Freeboard at the Inflow Design Flood must be one foot for High Hazard Dams and two feet for Significant and Low Hazard Dams;.

(c) Optional low elevation Spillway. An interior Spillway connected to the low level Conduit may be used for Low and Significant Hazard Dams, and for High Hazard Dams only with specific approval by

the State Engineer. The capacity of the low elevation Spillway may be considered in design of the overflow Spillway;~~.~~

(d) Stable Spillway control section. The Spillway control section must be hydraulically and structurally stable for the Inflow Design Flood and have permanent features so that the control section is identifiable for re-measurement of cross section during routine inspections;~~.~~

(e) Spillway channel stability. Spillways shall be designed to be structurally adequate and stable under all conditions of reservoir operation. Spillway structures of High Hazard Dams shall be designed for earthquake ground motions per OAR 690-020-0036;~~.~~

(f) Reinforced concrete specifications for spillways. Structural elements of reinforced concrete shall be designed for both strength and serviceability. The 28~~twenty-eight~~ day strength of structural concrete shall be provided. The strength properties of the reinforcing materials shall also be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements. Treatment of construction joints and contraction/expansion joints shall be described and special provisions for strength transfer and leakage prevention identified. Air entrainment shall be provided in cast-in-place concrete if needed for freeze-thaw protection, durability, and workability;~~.~~

(g) Debris booms. For High and Significant Hazard Dams, debris or log booms may be required. Where required, they shall be designed for the Spillway approach where logs and other debris may block or damage the Spillway structure. The design shall specify the necessary anchor capacity, and the design of the anchors;~~.~~

(h) Gates and Flashboards. Detailed drawings and specifications are required for Spillway Gate structures or flashboards, if present on the proposed Dam. Operations and maintenance plans are required for any Dam with a Gated Spillway, or where flashboards or stop-logs are used in the Spillway as per OAR 690-020-0350; and~~.~~

(i) Energy dissipation. The design of stilling basins for High Hazard Dams, and where required by the State Engineer for Significant Hazard Dams, shall be based on calculated hydraulic forces and designed to dissipate energy and minimize scour and erosion from the Inflow Design Flood.

(3) Low and Significant Hazard Dams constructed off channel are not required to have a Spillway, if redundant mechanisms to prevent overfilling are included in the design.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0043
Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit(s) and

Control of Flow through Conduits

New Dams on stream channels must have a low level Conduit. All other new Dams and Dams with increases to Dam Height must have a low level Conduit or other means to safely drain the reservoir. The Conduit and related control structures must be designed to meet the following criteria:

(1) Ability to lower the reservoir. The minimum diameter of the Conduit should be determined through analysis of the time required to drain the Dam at average annual inflow;

(a) The Conduits for High Hazard Dams shall be capable of releasing the amount of Water which could be stored in the top five feet of the reservoir in five days;~~.~~

(b) The Conduits for Significant and Low Hazard Dams must be able to release the amount of Water which could be stored in the top five feet of the reservoir in ten days;~~.~~

(c) All Conduits must be of sufficient size to allow passage of inflows as needed;~~.~~

(d) In no case shall Conduits be smaller than eight inches in diameter;~~.~~

(2) Durable and water-tight Conduits. Conduits must be made of medium to heavy gage durable materials. Pipe joints must be designed to seal and prevent leakage. Corrugated metal culverts are only acceptable for Low Hazard Dams, and only when the Conduits are encased in concrete. Encasement of Conduits in concrete may be used to assist in the design of a durable Conduit and to reduce the potential for seepage and erosion adjacent to the Conduit;

(a) Diaphragms using materials designed as an effective Soil Filter are required for any Conduits not designed as encased in concrete, and are required regardless of encasement for all High Hazard Dams;~~.~~

(b) Seepage collars may not be used; ~~in any Dam.~~

(3) Control Mechanisms. The design for the control mechanism must be sturdy and durable. The control mechanism must allow for air venting when needed, and allow manual operation to drain the reservoir if hydraulic or other power controls are inoperable. Hydraulic or other power controls must have redundancy if control relies on any submerged hydraulic or pneumatic hoses or electrical conduits. Intake structures for outlet works must have trash racks unless the Engineer of Record shows trash racks are unnecessary, or not ~~Un~~safe to ~~C~~construct due to conditions at the Dam site. For High and Significant Hazard Dams, measures to prevent unauthorized use of the control mechanism must be included in this design;

(4) Outlet structure. The outlet structure must not be submerged when the inlet control Gate or Valve is fully closed. The outlet structure must be designed to protect the Conduit from mechanical damage and convey Water to the stream channel without channel erosion and cavitation near the Gate

structure; and

(5) Pressurized operation. Conduits must be specified as suitable for pressurized operation if they are to be operated with controls other than at the inlet of the Conduit. Dams with Pressurized Conduits shall have a guard Gate installed at the upstream end of the Conduit. Operations and maintenance plans are required for any Dam designed for pressurized operation as per OAR 690-020-0350.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0044
Design Requirements for New Dams or to Increase Dam Height: Instrumentation for Monitoring
Designs must include methods for determining if the Dam is operating properly based on the Hazard Rating of the Dam, and include:

(1) A plan to share monitoring data with the Department;

(2) Staff gage near controls for the Conduit or where they can be easily seen by the Dam owner or operator. The staff gage shall be clearly marked in feet and tenths of feet, and extend to within one foot of the ~~Dam~~ Crest. Markings and numbers on the gage rod shall be of sufficient size to be easily readable from the ~~Dam~~ Crest;

(3) Multiple and easily accessible outlets of all Toe Drains. Toe Drains shall be designed to discharge into locations where flows can be evaluated and monitored. Multiple discharge points are required in order to isolate seepage to various sections of the Dam and Foundation. Discharge points must be located where routine Dam maintenance is not likely to damage the drains;

(a) For High Hazard Dams, drains must have a measuring weir or other device, and a basin for settling drainage Water so that internal erosion can be identified;~~.~~

(b) Where drainage galleries are provided for concrete Dams, seepage measuring devices should be provided and accessible for making the necessary readings;~~.~~

(4) Unique Identification. All instrumentation and exterior drains shall be labeled with a unique identifying marker designed for durability and to withstand maintenance activities; and

(5) All High Hazard and, when required by the Engineer of Record or State Engineer, Significant Hazard Dams shall have the following instrumentation:

(a) Monuments that allow measurement of the horizontal and vertical movements of the Dam. Control

or benchmark monuments shall be placed in areas not subject to movement;~~.~~

(b) Piezometers to allow monitoring of the phreatic surface within the Dam or for concrete Dams, to determine uplift pressures. Standpipe piezometers must be installed pursuant to monitoring well standards per OAR 690-240-0525;~~. (OAR 690-240-0525)~~

(c) Instrumentation to measure strong ground motions for publically owned Dams in locations where the peak ground acceleration in the 0.2 percent ~~a~~Annual ~~p~~Probability of ~~e~~Exceedance earthquake is greater than 0.3g at the ground surface.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0047
Design Requirements for New Dams or to Increase Dam Height: Geosynthetics
Geosynthetics shall not be used as the sole element employed to perform a Dam safety function. Redundant design features are required whenever geosynthetics are used for Dam safety functions.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0048
~~Modification of~~Exceptions to Standard Design Requirements
Exceptions to design standards may only be obtained with written approval from the State Engineer. Where the Engineer of Record requests design exceptions, the request must be in writing, be affixed with the Engineer of Record professional stamp, and include a report describing why design standards are inapplicable to the safety of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0055
Design Requirements for New Dams or to Increase Dam Height: Design Drawings
The Engineer of Record shall submit applicable drawings when the Engineer believes the design is ready for review and approval by the State Engineer.

(1) Drawings must accurately portray the work to be accomplished and be of sufficient detail to clearly define all features of the project. After all changes required by the State Engineer are made, final design drawings must be neatly and accurately drawn to a scale sufficiently large for the drawings to be readily interpreted.

(2) Drawings must be uncluttered and easy to understand for determination of design compliance by the contractor, the Engineer of Record, and the State Engineer.

(3) Drawings must be no larger than 24" X 36". Other acceptable sizes for drawings are 17" X 22" and 22" X 34" All drawings must have a graphic scale bar so that scale can be determined after enlargement or reduction. Each sheet shall be numbered sequentially with the first sheet being sheet number one along with the total number of sheets; e.g., 1 of 6.

(4) Drawings shall include the following information:

(a) An official Dam name, which must not have already been used for a Dam as indicated in the Oregon Dam Safety Database. This unique name must be affixed on each drawing;

(b) The first drawing must include a location map with the drainage basin, the Dam and reservoir, streams within the drainage area, and the location of the nearest access highway. This drawing must include legal location of the Dam including Section, Township and Range, and the location of the survey reference point with latitude, longitude, elevation, and datum elevation in NAVD1988;

(c) A contour map of the reservoir site showing the legal location of the Dam with a contour interval no greater than five feet. A plan of the Dam should be superimposed on this map. If scale permits, this drawing should show the location of the Spillway(s), Conduit inlet and outlet, and the location, distance and direction to a government land corner or other permanent survey marker;

(d) An area capacity curve showing the total capacity to the ~~top of the Dam~~Crest, with the Spillway invert~~Crest~~ elevation identified. Surface area and storage capacity curves must be in acres and Acre-~~F~~feet, respectively;

(e) A profile of the Dam site at the center of the Dam;

(f) A cross section of the Dam at maximum section;

(g) Plan view(s) of Dam at maximum section, and other sections as needed;

(h) Cross section(s) of Dam, including the maximum section with the official Dam Height;

(i) Spillway details, Spillway approach control discharge, and energy dissipation;

(j) Low level Conduit details, including diameter, material, encasement; and

(k) Slide Gate or Valve details including the trash rack, control stem, pedestal and wheel, or other control details, and air vent.

(5) Elevations must be clearly labeled on applicable drawings and include the:

(a) Base of Dam and official Dam Height;

(b) ~~Dam~~ Crest;

(c) Spillway control section;

(d) Base of Spillway discharge; and

(e) Invert of the Conduit at both the inlet and outlet.

(6) All drawings must be dated and have sufficient space for State Engineer's approval stamp, at least 3" x 3" near the lower right hand corner of the drawing.

(7) Drawings must be designated as final design drawings or As-built Drawings.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0060
Design Requirements for New Dams or to Increase Dam Height: Construction Specifications
All drawings for Dams must be accompanied by construction and material specifications that include the following:

(1) Construction conditions. Specifications must include the construction period based on typical weather and stream conditions for that location and if applicable, may include a process for the Engineer of Record to modify the construction period;~~.~~

(2) Clearing of the Dam site and reservoir. Specifications must include the area to be submerged by the new or enlarged reservoir and specify that the submerged area shall be cleared of logs and debris prior to filling the reservoir. The specifications must require that the footprint of the Dam shall be cleared of all soils containing organic materials, and that this material may not be used for Dam construction;~~.~~

(3) Cutoff Trench requirements. Specifications must include the minimum trench depth, width at base of the trench, and maximum side slope steepness. These specifications shall be based on the subsurface investigations and direct that the Cutoff Trench may not be filled if it contains standing Water. Specifications must also include a requirement not to begin filling the Cutoff Trench until approved by Engineer of Record, and where specified, approved by the Department;~~.~~

(4) Material specification standards. The specifications shall include material and testing specifications for Dam materials, Conduits, control structures, and other appurtenant structures, using an ASTM standard methodology if available;~~.~~

(5) Soil Compaction. The typical compaction specification is 95~~ninety-five~~ percent of standard proctor density, though the Engineer of Record may use a different compaction standard. Specifications shall include the types of acceptable compaction equipment, by material source if necessary. Specifications shall also include maximum lift thickness. Specifications shall prohibit soil compaction dry of optimum moisture content to reduce potential for leakage around the Conduit. For materials placed immediately above or adjacent to the Conduit, specifications must also include verification testing of soils, with representative samples selected for testing as directed by the Engineer of Record. Specifications must also require verification of testing of soil compaction, with representative samples selected for testing by the Engineer of Record, or Engineer's representative;~~.~~

(6) Concrete placement. Specifications shall include means to prevent separation of aggregate and cement, air entrainment requirements if needed, methods for placement and vibration of concrete, required minimum 28~~twenty-eight~~ day strength, slump, moisture and temperature requirements for curing. Alkali reactive aggregate shall not be used in the concrete;~~.~~

(7) Conduit specifications. Specifications must include the material, diameter, and thickness of the Conduit, and the length of Conduit required for the project. Methods for sealing joints must be specific. Specifications must require that all materials from a manufacturer are certified to meet this test, or that the Engineer of Record has tested the materials directly;~~.~~

(8) Accepting and Rejecting Materials. Specifications must include tolerances for acceptable departure from material specifications and a process for rejection of defective materials or workmanship;~~.~~

(9) Notification by the Engineer of Record to the State Engineer of changed conditions critical to the safety or operations of the Dam. Specifications shall include State Engineer notification if previously unidentified springs, slope movement or sand lenses are identified, or if storm or other damage occurs during construction;~~.~~

(10) The Engineer of Record or their qualified employees must supervise construction as needed to assure compliance with the approved construction plans and specifications; and~~.~~

(11) The specifications must also contain a provision to the effect that plans or specifications shall not be altered or changed without the written approval of the State Engineer.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0065
Plan Requirements for New Dams or to Increase Dam Height: Construction Administration
~~(1)~~ The Engineer of Record shall submit plans for administering the construction of the Dam to the State Engineer for approval. Construction plans must include the following:

(~~a~~1) A provision stating that the Engineer of Record or an employee working for the Engineer of Record shall be on-site as needed for instructions to the contractor, approval of initial excavation, acceptance of materials, and general project administration~~;~~.

(~~b~~2) A provision stating that the Dam owner shall cease construction activity if the Engineer of Record is no longer retained or for any reason cannot complete necessary construction administration activities. Construction may resume when a new Engineer of Record is employed, the State Engineer has been notified of the new Engineer of Record, and both Engineers have discussed the project~~;~~.

(~~c~~3) A provision stating that the Engineer of Record ~~is responsible for the construction of the Dam~~ will observe the Dam during construction as needed to determine if construction is consistent with approved design and construction documents. This provision shall also include a description of how the Engineer of Record will determine if construction work in progress fails to conform to the approved plans and specifications, and that such nonconforming work will be corrected; ~~should describe periodic inspections to evaluate whether the construction is proceeding in accordance with the approved plans and specifications and describe how the Engineer of Record will take actions to prevent defects and deficiencies in the construction of the Dam and require work identified that fails to conform to specifications be corrected.~~

(~~d~~4) A provision stating that the Engineer of Record shall confirm Foundation design assumptions once surface materials have been stripped and the Cutoff Trench excavated. Changes in actual Foundation conditions from assumptions made in the initial site evaluation shall be communicated to the State Engineer;

(~~2~~5) A provision in which the Engineer of Record shall maintain a record of construction that shall include:

(a) Logs of construction inspections whenever such inspections are made by the Engineer of Record or the Engineer of Record's employee;

(b) All test results pertaining to construction;

(c) Photographs; and

(d) Construction problems and remedies; and~~.~~

(~~3~~6) A provision stating that the Engineer of Record shall complete and stamp As-built Drawings and a final construction report, including statements that the observations are either consistent or inconsistent with the design drawings and specifications. If key elements of construction were not observed, the construction report shall detail those specific elements that were not observed.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0068
Plan Requirements for New Dams or to Increase Dam Height: Operations and Maintenance Plan

(1) The Engineer of Record shall include an operations and maintenance plan with the submittals for ~~construction~~ building a new Dam or increasing Dam Height~~of~~ for:

(a) Any Dam rated Significant or High Hazard; and

(b) Any Low Hazard Dam with:

(A) A Gate or flashboard as part of the Spillway; or

(B) A Valve on a Conduit that is not on the upstream side of the Dam.

(2) The Department may review implementation of the operations and maintenance plan during Dam safety inspections.

(3) Operations and maintenance plans shall include, but are not limited to:

(a) Directions for filling and emptying the reservoir when needed;

(b) Frequency of inspection of the interior of Conduits, including qualifications and guidance for Persons conducting and reporting on this inspection;

(c) Procedures for operation of all Gates and Valves;

(d) Specified minimum frequency for cycling and lubrication of all Gates and Valves;

(e) Standards for removal of trees and brush, and mowing other vegetation; including the frequency for the Dam owner to monitor vegetation and to take action to control brush if it obscures any face of the Dam, the Conduit, or the Spillway;

(f) Frequency of routine Dam observations, including identification of changes in seepage and

maximum permissible Dam deformations;

(g) A Water release plan in the event of a flood forecast when reservoir is above the maximum safe operating level established by the Engineer of Record~~a certain level~~;

(h) The measurement frequency for all monitoring instrumentation installed at the Dam; and

(i) Review and evaluation of conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, including actions identified in ~~[~~OAR 690-020-0250~~]~~.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0070
New Dams or to Increase Dam Height: Submittals and Notifications by the Engineer of Record
(1) The Engineer of Record must include an inundation analysis that complies with OAR 690-020-0120 prior to submitting the design report, plans and specifications and other documents, so that the Department can determine the Hazard Rating of the Dam.

(2) All final designs, drawings and specifications submitted to the State Engineer for approval must be prepared and stamped by an Engineer. The first page of the drawings, the specifications, and the construction administration plan must be stamped by the Engineer of Record. All submitted materials must be addressed directly to the State Engineer and labeled as a Dam safety submission.

(3) Final drawings shall be submitted on full size paper. The design reports and specifications must be submitted as packaged 8.5" x 11" ~~inch~~ bound documents, with maps folded within.

(4) For High Hazard ~~rated~~ Dams, the final Emergency Action Plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the Dam owner, or the Engineer of Record on behalf of the Dam owner, prior to commencing construction.

(5) A schedule of construction shall be provided to the State Engineer prior to initiating construction of any Significant or High Hazard Dam.

(6) The Engineer of Record shall notify the State Engineer to allow for Department inspection of the excavation prior to completion of the Cutoff Trench and all stripping of Foundation and Embankments. The required notice to the State Engineer is as follows:

(a) 48-hours for a Low Hazard Dam;

(b) 120-hours for a Significant Hazard Dam; and

(c) 240-hours or the time specified in the approval, whichever is longer, for High Hazard Dams.

(7) Any changes made to the designed location, Height or width of the Dam, or to materials used in Dam construction shall be reported in writing immediately to the State Engineer.

(8) Any slope instability ~~is~~ observed during construction in the Embankment or adjacent to the Dam or into the reservoir, ~~it~~ shall immediately be reported to the State Engineer by phone.

(9) The Engineer of Record must immediately notify the State Engineer if they are no longer the Engineer of Record. The notification shall be by phone and in writing.

(10) The Engineer of Record must submit a project completion report upon completion of the Dam. A project completion report must include the following:

(a) As-built Drawings. If possible, As-built Drawings shall be on the same sheet as the initial design drawings;

(b) Sufficient information to document that the Dam has been built according to the drawings with changes to improve safety as documented in the As-built Drawings, or that critical safety functions are unknown;

(c) A list of the dates the Engineer of Record was on site, the number and location of material tests, and observations of all changed conditions;

(d) Material testing results (compaction, strength, permeability);

(e) Observations and decisions made and communicated to the contractor or Dam owner;

(f) Photographs of key stages of construction, including, but not limited to, photographs of the Cutoff Trench, borrow pit development, trenching and placement of the Conduit, the Spillway before and after placement of concrete; and

(g) The signed professional stamp of the Engineer of Record.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.488, 540.449

690-020-0080
New Dams, or to Increase Dam Height, Written Approval by State Engineer
(1) No person shall build ~~Construct~~ a new Dam or increase Dam Height unless the State Engineer has

reviewed all necessary reports, drawings, plans and other information as submitted by the Engineer of Record and has approved those documents as indicated in written communication with the Engineer of Record.

(2) Prior to commencing construction activity, the Engineer of Record shall verify that all necessary documents related to the final design as identified in OAR 690-020-0035 are approved as indicated by the State Engineer's stamp on those documents.

(3) The State Engineer's approval of design plans and specifications shall be valid only for five years from the date of approval. Upon request, written requests for time extensions may be granted in writing by the State Engineer.

(4) No newly constructed Dam or Dam that has had Height modified may store Water until final written acceptance of a satisfactory project completion report has been submitted to and accepted by the Department.

(5) The Department shall notify the Engineer of Record and Dam owner in writing when the final project completion report has been received and accepted by the Department.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.488, 540.449

690-020-0100
Hazard Rating of Dams
(1) The Department shall assign all Dams a Hazard Rating of High, Significant, or Low.

(2) A High Hazard ~~r~~Rating will be based on the Dam breach inundation analysis as described in OAR 690-020-0120 using the following criteria to determine expected loss of life:

(a) An inundation depth of flowing Water of at least two feet over the finished floors of dwellings, other frequently occupied buildings, or road surfaces where a vehicle is likely to be present is likely to result in loss of life. The Department may also consider Water velocity in its determination of inundation depth establishing a High Hazard Rating;~~.~~

(b) An incremental increase of depth of flowing Water of one~~1~~ foot where recreational or other frequent use occurs downstream ~~to prevent~~is likely to result in ~~probable~~ loss of life. The Department will also use Water velocity in its determination of inundation depth establishing a High Hazard Rating;~~.~~

(3) A Significant Hazard Rating will be based on the Dam breach inundation analysis as described in OAR 690-020-0120, using depth and velocity of the flowing Water at affected structures, public

infrastructure, and other properties which shows likely damage to property and infrastructure but no loss of life.

(4) Any Dam subject to regulation under these rules that is not rated as High or Significant by the Department will be rated as Low Hazard.

(5) The Hazard Rating of a Dam shall remain in effect until the rating is revised by the Department. The Department may conduct Hazard Rating reviews and ~~D~~dam ~~B~~breach ~~I~~inundation ~~A~~analyses as evidence indicates the impacts to people, property, or infrastructure may have changed since the Hazard Rating was first set. The Dam owner will be notified of the change and have an opportunity to meet with the Department and obtain records of the Department's analyses.

(6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inundation analysis, in support of this request.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.488

690-020-0120
Dam Breach Inundation Analysis
(1) A Dam breach inundation analysis will be conducted as specified in this section to determine or revise ~~assess, establish, and revise~~the Hazard Rating of a Dam.

(~~1~~2) Any simplified and conservative hydraulic model may be used for the Dam breach inundation analysis to show that a Dam should be rated Low Hazard. The State Engineer may determine if the model was used appropriately and conservatively.

(~~2~~3) An accepted and hydraulically consistent computational model must be used to conduct the inundation analysis for Significant and High Hazard Dams.

(~~3~~4) A report summarizing the model information and results must be stamped ~~and submitted to the Department~~ by the ~~Engineer of Record~~Engineer. The summary report shall contain sufficient information to reproduce the model and shall include at a minimum the following information:

(a) The specific proprietary model name or method used for the analysis;

(b) Details regarding the model geometry;

(c) The specific mode of failure and any assumptions made in the selection of the mode of failure;

(d) A list of Dam breach parameters and any assumptions made in the selection of the breach parameters. The breach parameters must be based on Dam material and thickness and any other factors that would influence the time it would take for the Dam to breach from internal erosion, overtopping, or displacement;

(e) A list of all boundary and initial conditions and any assumptions in the selection of these conditions. For High and Significant Hazard Dams, the analysis must be conducted with reservoir at full pool and inflow equal to the 0.2% Annual Exceedance Probability Flood flow;

(f) A map indicating the inundation boundary, areas inundated by a depth greater than two~~2~~ feet, and all frequently occupied structures that fall within or are immediately adjacent to the inundation boundary;

(g) The breach flow as calculated by the model immediately downstream of the Dam. If an empirical formula was used as the basis for determining breach flow, the formula and all inputs must be clearly stated; and

(h) A sensitivity analysis evaluating the variability in model inputs may be required when the Dam breach inundation analysis results indicate the Hazard Rating is on the border between two ratings.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.488

690-020-0140
Modification of Dams

(1) No ~~p~~Person shall make Modifications to ~~Modify~~ a Dam unless the State Engineer has reviewed all required documents as described ~~in the following sections~~in this section and has approved those documents as indicated in written communication with the Engineer of Record or Dam owner.

(2) The following Dam ~~m~~Modifications require State Engineer approval of plans:

(a) ~~Any c~~Changes to or near the Spillway that may affect Spillway capacity or ability to pass flows safely;

(b) Placing, replacing, or relining any Conduit ~~or utility~~ within the Dam;

(c) Removal or alteration~~Replacement~~ of the Conduit control structure;

(d) Installation of a~~ny~~ new Valve on the downstream side of the low level Conduit~~, or directly connecting a pipe to the low level Conduit~~;

(e) Correction~~Repair~~ of damage where that damage has ~~that may have a potential~~ impacted ~~on~~ the safe functioning of the Dam;

(f) Any activity where 10 percent or more of the fill material in the Dam is disturbed; or

(g) Any other change to the Dam that results in a Modification as defined in OAR 690-020-0020(27). ~~deviation from the original design and that affects the safe functioning of the Dam~~

(3) Dam Modification plans shall include all details of the area of the Dam being modified. Specific modification plan requirements include, but are not limited to:

(a) For major Spillway damage or alteration~~repairs~~, plans need to address passage of the required Inflow Design Flood based on the Hazard Rating of the Dam, with the same criteria as required for new Dams in OAR ~~(~~690-020-0037~~)~~;

(b) For stabilization~~repairs~~ of slope movement, plans require slope stability analysis and appropriate corrective measures;

(c) For replacement of Conduits or installation of a Valve on the downstream side of a Dam, plans require an analysis of internal erosion potential;

(d) For internal erosion, plans must address construction of a filter zone; and

(e) Items required by the State Engineer pursuant to subsection (4).

(4) The Dam owner shall provide sufficient notice to the Department to allow for adequate time for discussion of the proposed Modifications and the necessary design requirements.

(5) The State Engineer will determine the design and submittal requirements. Submittal requirements and Department reviews may be expedited in the event of emergency or unanticipated weather-related situations.

(6) Water is not to be stored in the reservoir during modification. The Engineer of Record may propose maintaining some Water in storage during Dam Modification or modifying Dam Height if it is demonstrated that it can be done in a manner that protects life, property, and infrastructure. The Department will review submitted materials for the proposed construction actions. The Department may consider the scope of the project, including how the proposed construction actions will maintain safe Water levels through the duration of construction.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.449, 540.488

690-020-0160
Removal

(1) Dam owner(s) seeking Removal of ~~to remove or partially remove~~ any Dam with ~~that has~~ a High or Significant Hazard Rating must notify the Department.

(2) Dam owner(s) shall provide the Department with a ~~r~~Removal plan for evaluation prior to removing the Dam. Plans must be submitted a minimum of 60 days in advance of ~~r~~Removal to allow reasonable time to evaluate the ~~r~~Removal plan, unless the Department agrees to a different timeframe.

(3) A ~~r~~Removal plan must include:

(a) Descriptions and assumptions for the ~~r~~Removal ~~or partial removal~~ of the Dam;

(b) A description of the means for Removal of ~~removing~~ the Dam to prevent future impoundment and a method of draining the reservoir in a controlled manner prior to the start of the ~~r~~Removal;

(c) A schedule listing the major events and corresponding time frame that will occur during the ~~r~~Removal;

(d) A plan for disposal and stabilization of Dam material; and

(e) ~~In the case of a partial removal, a~~A drawing showing the planned ~~r~~Removal location, breach dimensions including side slopes, and lowest elevation of the breach. ~~For any partial removal,~~ the ~~r~~Removal plan must show that there will be sufficient material removed and left at slopes that will allow no breach flood by erosion of remaining materials.

(4) The Department may evaluate the ~~r~~Removal plan to ensure ~~that~~ the plan includes appropriate safety precautions to protect life, property, and public infrastructure from temporary inundation in the area below the Dam during Dam ~~r~~Removal.

(5) The Department may require ~~Modification~~ changes to the ~~r~~Removal plan or require that the work performed under the plan be supervised by an Engineer as necessary to protect life, property, or public infrastructure from temporary inundation during Dam Removal. If the Department requires changes to ~~Modification~~ the ~~r~~Removal plan or requires that work be supervised by an Engineer, the Department shall notify the Dam owner and provide an opportunity to meet with the Department.

(6) Upon completion of the Dam ~~r~~Removal, the owner shall notify the Department. The Department shall make a final inspection, if appropriate, and remove it from Department Dam safety oversight.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488

STATUTES/OTHER IMPLEMENTED: ORS 540.452, 540.488

690-020-0180
Requirement of Owners to Provide Contact and Transfer of Title Information
~~(1) If an Emergency Action Plan exists, a Dam owner shall provide the Department with contact information in the Emergency Action Plan consistent with OAR 690-020-0400, and notify the Department of any changes in contact information, including transfer of title for the Dam.~~

~~(2) If no Emergency Action Plan exists, a Dam owner shall:~~

~~(a) Provide the Department with contact information in writing for the Dam owner, the individual in immediate charge or the Dam, and the operator of the Dam, if other than the owner; and~~

~~(b) Notify the Department of any changes in contact information, including transfer of title for the Dam.~~
(1) A Dam owner shall:

(a) Provide the Department with contact information for:

(A) The Dam owner;

(B) The operator of the Dam, if other than the owner; and

(C) The individual in immediate charge of the Dam.

(b) Provide the contact information in an Emergency Action Plan developed pursuant to OAR 690-020-0400, or in writing if no Emergency Action Plan exists.

(c) Notify the Department in writing of any changes in the contact information, as soon as practicable and without unreasonable delay.

(2) A Dam owner shall notify the Department in writing after completing a transfer of title for a Dam, as soon as practicable.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.479, 540.488

690-020-0250
Maintenance of Dams
(1) The Dam owner shall review and evaluate conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, and address any detected conditions that may pose a risk of Dam

Failure.

(2) Proper maintenance includes, but is not limited to:

(a) Removing ~~al of~~ brush and trees from the Dam;

(b) Control of burrowing animals, especially nutria near the Dam or reservoir, including filling deep burrows;

(c) Restoration of areas of surface or wave erosion, and taking measures to prevent future erosion;

(d) Adding or moving fill to restore Crest Height and width;

(e) Clearance of soil, rock, vegetation and debris from the Spillway;

(f) Proper cycling and lubrication of Valves and Gates at least once a year, unless otherwise specified in a maintenance and operations plan approved by the Department;

(g) Patching, sealing, or replacing areas of cracked concrete on the Dam;

(h) Removing ~~al of~~ debris, rock, or earth from the inlet and outlet of penetrating Conduits and drains;

(i) Repair or replacement of worn or damaged parts of Gates or Valves;

(j) Ensuring access to the Dam is sufficient for inspection, repair and emergency actions, and that unauthorized access is controlled;

(k) Securing operating equipment such as Valve controls and Spillway controls;

(l) Evaluation of the Conduit and taking necessary actions to ensure the Conduit is not compromised, including patching pipes with minor corrosion; and

(m) Addressing other conditions that might affect the safety of the Dam, including Maintenance Actions identified by the Department in an inspection document.

(3) Records necessary to track the conditions of the Dam should be maintained.~~Maintain records as needed to track conditions on the dam.~~

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.455~~479~~, 540.479~~488~~, 540.488~~455~~

690-020-0260
Inspection of Dams
(1) The Department, or representatives of the Department, may inspect a Dam and the site, plans and specifications, features and other supporting information regarding the construction, maintenance and operation of a Dam.

(2) The Department will maintain a Dam inspection schedule based on the Hazard Rating of the Dam:

(a) High Hazard Dams are scheduled for inspection annually,

(b) Significant Hazard Dams are scheduled for inspection every three~~3~~ years, and

(c) Low Hazard Dams are scheduled for inspection every six~~6~~ years.

(3) Notwithstanding subsection (2), the Department may determine that a different inspection schedule is appropriate. The Department may consider staff resources and Dam risks or condition in determining that a different inspection schedule is appropriate.

(4) The Department shall provide the Dam owner with an inspection document describing the general condition of the Dam and specific ~~maintenance recommended or~~ Maintenance Actions ~~required~~ recommended by the Department.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.455~~479~~, 540.467~~455~~, 540.479~~467~~

690-020-0310
Requirement to Address Maintenance Actions Need for High or Significant Hazard Dams
(1) ~~Upon inspection of a dam, the Department will determine the need for maintenance action to address conditions observed during an inspection and shall provide this information to the Dam owner in the inspection summary for low hazard dams.~~ If, as a result of an inspection of a Dam that is rated High or Significant Hazard, the Department concludes that Maintenance Actions are needed, the Department shall use the process contained in this section as outlined below.~~The Department shall use the process that follows for maintenance action on dams that are rated Significant or High Hazard.~~

(2) Upon inspection of a Dam that is rated ~~as~~ High or Significant Hazard, the Department shall provide specific written notice ~~to the Dam owner~~ in the inspection document, describing the observed condition of the Dam and ~~shall inform~~informing the Dam owner of ~~necessary~~ needed ~~m~~Maintenance ~~a~~Actions ~~needed to correct maintenance deficiencies.~~

~~(a)~~ The ~~notification~~notice in the inspection document shall ~~provide~~ inform the Dam owner ~~with~~ of the

opportunity to meet with the Department concerning the information provided in the inspection ~~notification~~document.

(a) Upon request of the Dam owner, the Department may provide more specific information regarding the inspection and the maintenance needs of the Dam. ~~In addition, the Department and the Dam owner may enter into a Stipulated Correction Plan that provides dates certain by which necessary maintenance actions are performed.~~

(b) The Department may evaluate whether ~~maintenance was successfully~~needed Maintenance Actions were completed during the next scheduled inspection of the Dam or ~~the Department may expedite the Dam~~sooner, pursuant to OAR 690-020-0260(3). ~~inspection schedule for the next inspection to determine whether recommended conditions have been completed.~~

(3~~c~~) If, upon inspection of the Dam, the Department determines that the Dam owner has failed to take the necessary ~~m~~Maintenance ~~a~~Actions as identified in the notice of a prior inspection ~~notification document~~or a Stipulated Correction Plan, the Director~~Department~~ may proceed to issue a proposed final order as provided in OAR 690-020-0460~~.~~ or the Department and the Dam owner may enter into a stipulated corrective plan that provides dates certain by which necessary Maintenance Actions are performed.

(4) A proposed final order may include, but is not limited to, ~~provisions including, but not limited to~~ provisions:

(~~A~~a) Requiring performance of the needed Maintenance Actions ~~necessary maintenance requirements~~ identified in the inspection ~~notification~~ document notice by a date certain as specified by the Department;

(~~B~~b) An assessment of civil penalties consistent with OAR 690-020-0600.

(5~~d~~) At any time subsequent to receipt of a proposed final order, the Dam owner may enter into a ~~S~~stipulated ~~C~~corrective ~~P~~plan to resolve the matters asserted in the proposed final order as provided in ORS 183.417.

(6) If the Dam owner performs needed ~~m~~Maintenance ~~a~~Actions to the satisfaction of the Department and consistent with the proposed final order or ~~S~~stipulated ~~C~~corrective ~~P~~plan, the Director may not assess or pursue civil penalties for the matters identified in the proposed final order or ~~S~~stipulated ~~C~~corrective ~~P~~plan.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.467, 540.455, 540.488

690-020-0340
Potentially Unsafe or Unsafe Conditions

~~(1) The Department shall determine whether a High or Significant rated Dam is potentially unsafe or unsafe after inspection or analysis of the Dam. Potentially unsafe or unsafe conditions must be addressed by any lawful remedy available to the Department including issuance of a proposed final order as specified in this rule.~~

(1~~2~~) The following conditions may result in the Department concluding that a Dam is Potentially Unsafe ~~conditions include, but are not limited to~~:

(a) Embankment materials highly vulnerable to internal erosion;

(b) Highly variable and increasing rates of seepage that may lead to internal erosion;

(c) Seismic analysis determines significant Crest loss with little Freeboard remaining;

(d) For Dams in high seismic zones, a layer of liquefiable material in the Dam or its Foundation;

(e) Evidence of prior large rapidly moving landslides identified above the Dam, increasing the risk of Dam Failure from floods and earthquakes;

(f) Spillways are unable to pass the Inflow Design Flood as stated in OAR 690-020-0037 or Probable Maximum Flood; ~~or~~

(g) Issues on the Spillway invert that could lead to rapid loss of Spillway integrity during a flood; or

(h) Any other condition that meets the definition of Potentially Unsafe.

(2~~3~~) The following conditions may result in the Department concluding that a Dam is Unsafe ~~conditions include, but are not limited to~~:

(a) A~~ny~~ reduction in Spillway capacity;

(b) Movement of the Dam over a short period of time;

(c) Major loss of Freeboard;

(d) Wave erosion narrowing ~~Dam~~ the Crest;

(e) Internal erosion with limited movement of Embankment material;

(f) Seepage level rising on the downstream face of the Dam;

(g) Landslide or other deformation on the Dam;

(h) Rapid erosion of the Spillway;

(i) Significant loss of mass of a concrete Dam;

(j) Concrete Spillway with large voids or openings through the slab;

(k) Conduit deteriorated to where Conduit collapse is reasonably possible;

(l) A Pressurized Conduit with holes in the pipe;

(m) Flashboards in place during high runoff season;

(n) Animal burrows penetrating deep into the Dam;

(o) Large trees growing near the Crest ~~of the Dam~~; ~~or~~

(p) ~~Any new Dam construction or construction of a Dam to increase~~Building a new Dam or increasing Dam Height ~~in violation of requirements for~~without examination and written approval by the State Engineer of site plans, specification, and other supporting information for that Dam; or~~.~~

(q) Any other condition that meets the definition of Unsafe.

(34) Notification of Potentially Unsafe or Unsafe Conditions. If, as a result of an inspection or analysis of a Dam that has a High or Significant Hazard ~~r~~Rating the Department concludes that corrective action is necessary to address a condition allegedly rendering the Dam Unsafe or Potentially Unsafe, the Department shall provide written notification to the Dam owner by registered or certified mail~~,~~ with return receipt requested, sent to the address of record on file with the Department, as per OAR 690-020-0180, for the Dam owner.

(a) The written notification shall include at least the following:

(A~~i~~) An explanation of why the inspection or analysis of information and conditions causes the Department to conclude that the Dam is ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe;

(B~~ii~~) Any action the Department concludes is necessary to address the alleged ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions;

(C~~iii~~) Notice to the Dam owner of the opportunity to meet with the Department to discuss the notification; and

(D~~iv~~) Notice to the Dam owner of the opportunity to provide information to explain why the Dam owner disagrees with the matters asserted in the notification alleging the Dam is Unsafe or Potentially Unsafe.

(b) Following issuance of a notification, the Department may ~~endeavor~~ attempt to resolve the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions ~~identified~~ in cooperation with the Dam owner. The Dam owner may endeavor to develop a plan and timeframe for corrective action that is agreeable to the Department. If the plan and timeframe are agreeable, ~~T~~the Department and owner may enter into a consent order to address the corrective action~~, but only as such cooperation and agreement results in~~ for timely resolution of the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions. In determining whether a plan and timeframe is agreeable and developing a consent order, the Department may consider any relevant information, including, but not limited to:

(A~~i~~) The design and construction of the specific Dam;

(B~~ii~~) The efforts and resources of the Dam owner; and

(C~~iii~~) The impacts associated with Dam failure.

(4~~5~~) In addition to any other available remedies, ~~T~~the Director~~Department~~ may issue a ~~p~~Proposed ~~f~~Final ~~o~~Order in the event the Department and the Dam owner do not agree to a plan and timeframe and enter into a consent order~~stipulated corrective action agreement~~ to address corrective actions, if the Dam owner fails to complete ~~necessary~~ actions as provided in the consent order, ~~or~~ in the event the Dam owner does not otherwise address the matters identified in the notification to the Department's satisfaction, or if the Department concludes based on inspection or analysis that the Dam is Unsafe.

(a) The proposed final order shall include the specific information and conditions that have caused the Department to conclude that a Dam is ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe, shall be consistent with ORS 183.415, and shall provide notice of the opportunity for a contested case hearing pursuant to ORS 183. The proposed final order shall include the notification in subsection (3) of this section, if notification has not already been provided for an Unsafe Dam.

(b) The proposed final order may include, but need not be limited to, any or all of the following provisions:

(A~~i~~) ~~Notifying the Dam owner what information and conditions caused the Department to determine that the Dam is unsafe or potentially unsafe and the actions the Department concludes are necessary to address the unsafe or potentially unsafe conditions.~~

~~(ii)~~ A requirement that the Dam owner consult with an ~~e~~Engineer to assess the nature and extent of the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions identified by the Department and, as necessary, to identify corrective actions to address the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions;~~.~~

(B~~iii~~) Commencement and completion dates for any corrective action the Department determines is necessary to remedy the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions;~~.~~

(C~~iv~~) Restrictions on the maximum Water level in the reservoir until corrective action has been completed to the satisfaction of the Department;~~.~~

(D~~v~~) Provisions directing that the Dam may not be used for the impoundment, restraint, or conveyance of Water until corrective actions have been completed to the satisfaction of the Department;~~.~~

(E~~vi~~) A r~~R~~equirement to install and maintain monitoring equipment if the Department concludes that monitoring is necessary to protect life, property, or public infrastructure. The provisions requiring the installation and use of monitoring equipment at a Dam to monitor the ~~u~~Unsafe or ~~p~~Potentially ~~u~~Unsafe conditions shall include the ability to ~~the~~ use the most economical monitoring equipment ~~which is~~ sufficient to protect life, property, and public infrastructure as determined by the Department.

(5~~6~~) Upon issuance of a proposed final order, the Dam owner and Department may enter into a ~~C~~consent order to resolve the matters in the proposed final order as provided in ORS 183.417. Any such document must include conditions to address the matters in the proposed final order as determined by the Department.

(6~~7~~) If, following issuance of a proposed final order regarding a Dam that the Department has concluded is Unsafe, the Department receives a request for hearing from the Dam owner, the Director may request that the scheduling of any contested case hearing be expedited, and the Office of Administrative hearings shall expedite the contested case hearing to the extent that the office considers it practicable and will give the Dam owner reasonable time to prepare.

(a) In determining the expedited timeline practicable, the Office of Administrative Hearings shall consider, based on information provided by the Department, any conditions that may affect the urgency of the proceedings or the likelihood that ~~u~~Unsafe ~~or potentially unsafe~~ conditions may pose near-term threat to life, property, or public infrastructure.

(b) The reasonable time to prepare for a contested case hearing shall be based on the likelihood that ~~u~~Unsafe ~~or potentially unsafe~~ conditions may pose a near-term risk to life, property, or public infrastructure.

(7~~8~~) Issuance of a proposed final order does not preclude the Department from pursuing any and all

lawful remedies as the Department may determine are necessary to protect life, property, or public infrastructure including, but not limited to, seeking injunctive relief in the circuit court as provided in ORS 540.473.

(89) In addition to any other available lawful remedies, if a proposed final order issued under this section becomes final by operation of law or on appeal, and the Dam owner fails to comply with the order as specified in the order, the DirectorDepartment may request the Attorney General or the district attorney of any county where all or part of the Dam is located to bring an action declaring the Dam a public nuisance and ordering its rRemoval at the owner's expense.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.458, 540.461, 540.470, 540.473, 540.476

690-020-0400
Emergency Action Plans (EAP)
(1) An owner of Alla High Hazard Dams shall develop have an Emergency Action Plan (EAP) consistent with this section. The EAP is to assist the Dam owner and local emergency management personnel to ensure human safety in the event of a potential or actual Dam Failure. The final EAP, for new Dams or where Dam height is modified, must be reviewed and approved by the State Engineer.

(2) For new Dams or to increase the Dam Height of High Hazard Dams, theA Draft EAP is required to be submitted as part of the plans and specifications in OAR 690-020-0035 and OAR 690-020-0080(1), prior to commencing new Dam construction.

(3) A final EAP must be submitted prior to filling a new reservoir. The final EAP must be reviewed and approved by the State Engineer.

(34) Owners of Dams which have been reclassified to a High Hazard Rating will be required to develop and submit an EAP within one year of being notified of the reclassification by the Department.

(45) An EAP shall contain, at as a minimum, the following key elements:

(a) Means for emergency condition detection;

(b) Means for emergency level determination;

(c) Identification of, and information necessary for, notification and communication to be made at each level of emergency condition, including, but not limited to, contact information required in OAR 690-020-0180(1);

(d) Description of actions to prevent a Dam Failure incident or to help reduce the effects of a Dam Failure ~~and~~ to facilitate response to an emergency;

(e) A map of Dam Failure inundation zones developed using a Dam breach inundation analysis for varying conditions as specified by the Department, including, but not limited to, dry weather conditions and high flood conditions. The Department may require one inundation map if the dry weather and high flood flows are not substantially different. The inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section; and

(f) Procedures for termination of the emergency.

(5~~6~~) The Dam owner shall file copies of the EAP with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located.

(6~~7~~) The Department will, in consultation with the local Office of Emergency Management:

(a) Periodically review the EAP and may require updates to the plan that recognize the actual capabilities of the local emergency managers~~;~~, and

(b) Determine the appropriate frequency for conducting emergency response exercises.

~~(8) In the event of an actual or potential Dam Failure which creates an imminent risk to life, the Dam owner shall immediately implement the actions specified in the EAP.~~

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.479, 540.482, 540.485, 540.449, 540.488

~~**690-020-0410**~~
~~**Emergency Actions for Significant Hazard Dams**~~
~~If an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure, and no EAP exists for the Dam, the Dam owner shall immediately:~~

~~(1) Notify the local emergency services agency, the Department, and Persons in areas where the potential for Dam Failure creates risk to life, property, or public infrastructure by telephone or other methods that ensure immediate notification, and~~

~~(2) Take all practicable actions to prevent Dam Failure.~~

~~STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488~~

~~STATUTES/OTHER IMPLEMENTED: ORS 540.482, 540.485~~

690-020-0420
Immediate Action to Prevent Dam Failure

(1) If an actual or potential Dam ~~f~~Failure creates an imminent risk to life, property, or public infrastructure and an Emergency Action Plan exists for that Dam, a Dam owner ~~must~~ shall immediately implement the actions specifiedc in the~~at~~ plan.

(2) If no EAP ~~emergency plan~~ exists, and an actual or potential Dam ~~f~~Failure creates an imminent risk to life, property, or public infrastructure, the Dam owner shall immediately notify by telephone or other method that ensures immediate notification:

(a) The local emergency services agency for the county where the Dam is located, via 9-1-1 call, if the dam has a Significant Hazard Rating;

(b) The Department; and

(c) To the extent practicable, ~~p~~Persons in ~~the~~ areas where the potential for Dam ~~f~~Failure creates a risk to life, property, or public infrastructure.

(3) In addition, if an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure ~~to providing notification as described in this rule~~, a Dam owner ~~must~~ shall also take ~~any and~~ all practicable measures to prevent Dam ~~f~~Failure.

(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, ~~it may take any immediate action to prevent failure of the Dam f~~Failure. ~~T~~the Department may~~:~~

~~(a) Immediately~~ contact and advise the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure.~~;~~

(~~b~~5) If a Dam has a Significant or High Hazard ~~r~~Rating and presents an imminent risk of dam failure, the Department or its agents or representatives may enter the property without notice or permission of the pertinent landowner to access the Dam and evaluate the condition or risk or to undertake necessary actions described in subsections (6) and (7). The Department's entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary~~;~~.

(6) The Department may communicate and coordinate actions necessary to reduce the risk of dam failure.

(7~~c~~) If the Department observes that there is a rapidly increasing leakage risk of overtopping at a Dam

that has a Significant or High Hazard ~~r~~Rating, the Department may ~~perform any or all of the following actions:~~

~~(A) O~~open Gates or Valves and siphon or pump Water to reduce the Water levels in the reservoir.~~;~~

(8) The Department may, as necessary to address an actual or potential Dam Failure that poses an imminent risk to life, property, or public infrastructure:

(a~~B~~) Modify approval requirements for emergency construction work;

(b~~C~~) ~~Allow Modification~~Waive or modify ~~of~~ the actions prescribed in an Emergency Action Plan; and~~,~~

(~~D~~d) Pursue any other lawful remedy.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.482, 540.485, ORS 540.488

690-020-0460
Proposed Final Order, Request for Hearing, Contested Case Process

(1) Proposed Final Order, Notice of Assessment of Civil Penalty. A proposed final order or a ~~N~~notice of ~~A~~assessment of ~~C~~civil ~~P~~penalty must be consistent with the provisions of ORS 183.415, shall include notification of the right to a contested case hearing pursuant to ORS 183, and shall include any applicable or required element otherwise specified in Dam safety rules governing proposed final orders. A proposed final order or a ~~N~~notice of ~~A~~assessment of ~~C~~civil ~~P~~penalty must be served personally or by registered or certified mail.

(2) Request for Hearing. A Dam owner that receives a proposed final order or a ~~N~~notice of ~~A~~assessment of ~~C~~civil ~~P~~penalty has 30~~20~~ calendar days from the date of service of the proposed final order in which to file a written request for hearing. The request for hearing must be filed either in person or by mail addressed to the Department's office in Salem, Oregon. The request for hearing may not be considered timely filed unless it is received in the Department consistent with this subsection. The request for hearing must include a written response specifying ~~that admits or denies all factual matters alleged in the notice, and must state with specificity~~ the reasons for disagreement with the proposed final order.

(3) Contested Case Procedure. Contested case hearings resolving requests for hearing to proposed final orders issued by the Department under these rules shall be heard by administrative law judges from the Office of Administrative Hearings. Hearings shall be conducted as provided in ORS 183 and the Attorney General's Uniform and Model Rules of Procedure under the Administrative Procedures Act in OAR 137-003-0501 to ~~–~~0700 except:

(a) Only a Dam owner or the Dam owner's authorized representative may request a contested case hearing and be considered a party in any contested case;.

(b) For expedited contested case hearings regarding proposed final orders addressing uUnsafe or potentially unsafe conditions, discovery methods as provided in OAR 137-003-0566 shall not be allowed because the availability of other forms of discovery would unduly delay proceedings to address conditions that address a near-term risk of threat to life, property, or public infrastructure. Notwithstanding, a party may request public documents pursuant to a request for public records made to the Department as described in OAR Chapter 690, Division 3; and.

(c) Immediate review under OAR 137-003-0640 is to the Director only.

(4) Proposed Order in Contested Case. Following the close of the record for a contested case hearing, the administrative law judge will issue a proposed order and shall serve the proposed order on each participant to the contested case.

(5) Exception to Proposed Order. If the recommended action in the proposed order is adverse to any party, the party may file written exceptions to the Department within 15 calendar days after a proposed order is served.

(6) Final Order. The Director may consider any exceptions received and shall issue a Ffinal Oorder as provided in OAR 137-003-0665. An order adverse to a party may be issued upon default as provided in OAR 137-003-0672.

(7) The Department and a Dam owner may at any time use informal or alternative means to resolve a contested case hearing. When informal disposition of a contested case is made by stipulation, agreed settlement or consent order, the final order that incorporates the informal disposition is not subject to judicial review.

STATUTORY/OTHER AUTHORITY: ORS 183, 536.027, 540.488, 183
STATUTES/OTHER IMPLEMENTED: ORS 183, 540.458461, 540.461467, 540.467488, 540.470, 540.488995, 540.995458

690-020-0600
Civil Penalty Assessment for Dam Safety
(1) The Department may assess civil penalties for the following violations:

(a) Constructingon of a Dam without prior written approval from the Department of the final Dam design, construction documents, and operation documents as described in OAR 690-020-0080(1) and 0140(1);

(b) Impoundment of Water behind a Dam before final documentation has been submitted and accepted by the Department as provided in ~~in~~ OAR 690-020-0080 ~~-~~(4) and 0150(6);

(c) ~~Beginning construction to remove a~~Removal of a High or Significant Hazard ~~Rated~~ Dam ~~rated as High or Significant Hazard~~ prior to providing a Removal plan~~notice to the Department~~, as ~~provided~~required in OAR 690-020-0160;

(d) Failure to file an Emergency Action Plan with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located, as provided in OAR 690-020-0400; and

(e) Failure to complete needed ~~Dam~~ Maintenance Actions on a High or Significant Hazard Dam, as identified in a prior inspection document sent from the Department to the Dam owner, as described in OAR 690-020-0310.

(2) The civil penalty for Constructing~~beginning construction of~~ a Dam prior to obtaining written approval from the Department of final Dam design, construction, and operation documents prior to Dam construction activity shall be $2,000 for a High Hazard ~~Rated~~ Dam, $1,000 for a Significant Hazard ~~Rated~~ Dam~~,~~; and $500 for a Low Hazard ~~Rated~~ Dam.

(3) The civil penalty for impounding Water prior to submission and acceptance by the Department of the final plans and specifications shall be $1,000 per occurrence for a High Hazard ~~Rated~~ Dam, $500 per occurrence for a Significant Hazard ~~Rated~~ Dam~~,~~; and $250 per occurrence for a Low Hazard ~~Rated~~ Dam.

(a) Each day the Dam impounds Water is considered a new occurrence and violation. A civil penalty may be assessed for each day of violation for the period the reservoir is impounding Water until satisfactory completion documents are submitted to and accepted by the Department, ~~or~~ until the reservoir is emptied, whichever is sooner.

(b) The Department may remit all or a portion of a civil penalty if completion documents existed but were not submitted, and those documents meet the criteria, or for Dams which are modified to be exempt from Dam safety requirements as per ORS 540.446 ~~-~~(1)~~)~~.

(4) The civil penalty for beginning construction work to remove a Dam rated as High or Significant Hazard prior to submission and acceptance of a Dam ~~r~~Removal plan, failure to modify the plan if required, or failure to follow the modified plan shall be $2,000 for a High Hazard ~~Rated~~ Dam and $1,000 for a Significant Hazard ~~Rated~~ Dam.

(a) Each day construction work is performed to remove the Dam is considered a new occurrence and violation. A civil penalty may be imposed for each day of violation beginning on the day ~~r~~Removal

activities began until the Dam is no longer storing Water and construction work to remove the Dam has ceased.

(b) The Department may remit all or a portion of this civil penalty if the Department receives and accepts a Dam ~~r~~Removal plan and determines that Dam ~~r~~Removal was consistent with the plan and completed safely with no downstream damage.

(5) The civil penalty for failure to file an Emergency Action Plan for a High Hazard ~~Rated~~ Dam with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located shall be $2,000.

(a) Each month the Emergency Action Plan is not filed is a new occurrence and violation. A civil penalty may be imposed for each month of violation beginning on the date the notice of violation was first provided to the responsible party.

(b) The Department may remit all or a portion of the civil penalty if development of the plan is underway and the plan is submitted within 60 days of the due date.

(6) The civil penalty for failure to complete needed Maintenance Actions identified in a prior inspection document for Dams rated as High or Significant Hazard shall be:

(a) A civil penalty of $500 may be assessed for failure to perform required Maintenance Action(s) on a High Hazard ~~Rated~~ Dam which could result in the Dam becoming Unsafe. Each month will be considered ~~constitute~~ a new violation until the required Maintenance Action(s) is ~~are~~ completed;

(b) A civil penalty of $250 may be assessed for all other required Maintenance Action(s) for a High Hazard Dam. Each month will be considered a new violation until the required Maintenance Action(s) is ~~are~~ completed;

(c) A civil penalty of $250 may be assessed for failure to perform required ~~m~~Maintenance Action(s) on a Significant Hazard ~~Rated~~ Dam which could result in the Dam becoming Unsafe. Each month will be considered a new violation until the required Maintenance Action(s) is completed;~~Each month the violation continues will be considered a new violation;~~

(d) A civil penalty of $150 may be assessed for failure to complete all other required ~~m~~Maintenance Action(s) for a Significant Hazard ~~Rated~~ Dam. Each month will be considered a new violation until the required Maintenance Action(s) is completed; and~~Each month that the required Maintenance Action(s) is not completed will be considered a new violation; and,~~

(7~~e~~) The Department may remit all or a portion of a ~~C~~civil ~~P~~penalty, considering the Dam owner's efforts to comply. ~~if the Dam owner voluntarily complies with a schedule for repairs that allows~~

~~necessary engineering or inspection expertise to address the maintenance issue, or allows for work during more favorable and safe weather conditions.~~

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449~~467~~, 540.452~~482~~, 540.467~~488~~, 540.482~~449~~, 540.488~~452~~, 540.995

CHAPTER 690
DIVISION 20
Dam Safety

690-020-0000
Purpose and Applicability

(1) The purpose of these rules is to implement ORS 540.443 through 540.491 and ORS 540.995, as well as applicable sections of ORS 536.050 and ORS 537.400, through actions that are intended to ensure the safety of the Dams, insofar as Dams may affect possible loss of life or property, and damage to public infrastructure. Prioritization of Dam safety actions and requirements are based on the Hazard Rating of the Dam. These rules outline processes to:

(a) Review design and specifications to Construct a Dam;

(b) Review plans for Removal of Significant Hazard and High Hazard Dams;

(c) Conduct routine inspections and notify Dam owners of outcomes;

(d) Cooperate with Dam owners over Dam safety issues;

(e) Prescribe Maintenance Actions, corrective actions, or any other actions necessary to protect life, property, or public infrastructure consistent with the Department's authorities and with law, and to pursue formal enforcement as necessary;

(f) Communicate, coordinate, and collaborate with Persons, Tribes, or other government entities regarding Dam safety; and

(g) Plan for and respond to emergencies as necessary and as consistent with law.

(2) These rules do not apply to:

(a) Dams that are less than ten feet in Height or that impound less than three million gallons (9.2 Acre-feet) of Water;

(b) Water storage Tanks or various types of Tanks that are part of Water treatment facilities; and

(c) Dams regulated under a federal Dam safety program, except as provided in ORS 540.446 and OAR 690-020-0024.

(3) Compliance with ORS 540.443 through 540.491 and these OAR Chapter 690, Division 20 rules does not relieve the owner or operator of a Dam or an individual in immediate charge of a Dam from any duty, obligation, or liability regarding the ownership, maintenance, or operation of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 536.050, 537.400, 540.446, 540.488, 540.491

690-020-0022
Definitions
Unless the context requires otherwise, the following definitions apply in OAR Chapter 690, Division 20:

(1) “Abutment” means a natural valley or canyon side against which the Dam is built;

(2) “Acre-feet” means the unit of volume equal to one acre covered with one foot of Water (325,851 gallons);

(3) “Annual Exceedance Probability Flood” means the likelihood of a specific flood flow being equaled to or exceeded in any given year at that specific location, expressed as a percentage;

(4) “As-built Drawing” means an engineering drawing of a Dam as it was actually constructed, noting all differences between original design and actual constructed condition;

(5) “Conduit” means a closed conveyance used to release Water through a Dam;

(6) “Core” means a soil of low permeability within an Embankment Dam;

(7) “Construct” has the meaning given to the term in ORS 540.443;

(8) “Constructing” has the same meaning as “Construct”;

(9) “Crest” means the top of the Dam;

(10) “Cutoff Trench” means a trench excavated beneath the Dam Foundation and backfilled with low permeability material to retard Water seepage;

(11) “Dam” has the meaning given to the term in ORS 540.443;

(12) “Dam Failure” has the meaning given to the term in ORS 540.443;

(13) “Department” means the Oregon Water Resources Department;

(14) “Director” means the Director of the Oregon Water Resources Department;

(15) “Embankment” means an engineered earth fill;

(16) “Emergency Action Plan” or “EAP” has the meaning given to the term in ORS 540.443;

(17) “Engineer” means an individual who is registered in this state and holds a valid certificate to practice engineering in this state as provided under ORS 672.002 to 672.325;

(18) “Engineer of Record” means a professional engineer registered in Oregon retained by a Dam owner to analyze, plan, and design a Dam to current safety standards, to oversee safe construction of a Dam, to supervise Modification or Removal of a Dam, or to oversee corrective actions identified by the Department, or to otherwise administer activities for a Dam;

(19) “Foundation” means the ground surface upon which a Dam is constructed;

(20) “Freeboard” means the vertical distance between the high-water level in the reservoir and the low spot on the Crest;

(21) “Gate” or “Valve” means a permanent device for regulating Water flow through the Dam;

(22) “Hazard Rating” means the categorization of a Dam established by the Department based on the potential damage to life, property, or public infrastructure downstream of a Dam in the event of a Dam Failure;

(22) “Height” means the maximum height of the Dam above natural ground as measured at the maximum section along the Dam’s longitudinal axis;

(23) “High Hazard Rating” or “High Hazard” has the meaning given to the term in ORS 540.443;

(24) “Inflow Design Flood” or “IDF” means the peak flood flow that the Engineer of Record will design to safely pass over or through the Spillway;

(25) “Low Hazard Rating” or “Low Hazard” means that if a Dam were to fail, loss of life would be unlikely, and damage to property or public infrastructure would not be extensive;

(26) “Maintenance Action” has the meaning given to the term in ORS 540.443;

(27) “Modification” means changes to a Dam that have a potential impact on the safe functioning of the dam, are to an extent that the modified dam structures no longer conform to the original design, and do not include modifying Dam Height, performing Maintenance Actions, or Removal of a Dam;

(28) “Person” has the meaning given to the term in ORS 536.007;

(29) “Potentially Unsafe” has the meaning given to the term in ORS 540.443;

(30) “Pressurized Conduit” means any pipe that penetrates into a Dam so that there is hydrostatic pressure due to the location of a Gate, Valve, or pipe connection;

(31) “Probable Maximum Flood” or “PMF” means the largest flood that could occur at a specific location, determined by the most severe set of atmospheric, soil moisture, and snowpack conditions that are reasonably possible at that location;

(32) “Removal” means demolishing all, or a portion of, the Dam structure permanently preventing storage of Water and allowing safe and natural passage of flood flows downstream;

(33) “Significant Hazard Rating” or “Significant Hazard” has the meaning given to the term in ORS 540.443;

(34) “Soil Filter” means soil with a gradation designed to inhibit movement of adjacent, finer grained soils;

(35) “Spillway” means any structure constructed to bypass Water, including flood waters, to prevent Water overtopping the Crest;

(36) “State Engineer” means an Engineer employed by the Department that is either the director or a principal assistant working for the director as described in ORS 536.032;

(37) “Tank” means a fully-enclosed (bottom and sides) hydraulic structure made from metal, reinforced concrete, rigid fiberglass, or plastic that provides its own Water-sealing and structural stability;

(38) “Toe Drain” is a drainage structure designed to collect and remove seepage Water from the toe of the Dam and to discharge this Water in a manner where it can be measured;

(39) “Unsafe” has the meaning given to the term in ORS 540.443;

(40) “Water” means water or wastewater;

(41) “Zoned Embankment” means an Embankment Dam with a Core of low permeability materials, Soil Filter materials, drainage, and other materials placed to improve performance and safety of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443

690-020-0024
General Department Authorities and Intergovernmental Coordination
In addition to any other powers of the Department, in carrying out its duties, functions, and powers, under these rules and ORS 540.443 through 540.491 and 540.995, the Department may:

(1) Enter into contracts, memorandums of understanding and intergovernmental agreements for the inspection, evaluation or study of Dams, or the response to Dam Failure or potential Dam Failure.

(2) Accept moneys from any public or private source for the administration and enforcement of ORS 540.443 through 540.491 and these Division 20 rules for enhancing the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.

(3) Coordinate with federal, Tribal, state, local, and private entities to enhance the safety of Dams or the protection of life, property, or public infrastructure in areas below Dams.

(4) Waive or reduce fees for Dams inspected by another state agency under a memorandum of understanding with the Department.

(5) Aid in the inspection of a Dam and provide advice and assistance to prevent, mitigate, or respond to a potential or actual Dam Failure if there is a potential or actual risk of Dam Failure at a Dam regulated under a federal Dam safety program.

(6) Accept the reports of consulting Engineers, engineering geologists or other specialists employed by the Dam owner.

(7) Employ consulting Engineers, engineering geologists, or other specialists to make special examinations and inspections, and to prepare reports for the Department if the Department concludes that existing reports are insufficient. The cost of such special examinations, inspections, and reports shall be paid by the Department, or upon mutual agreement, may be divided between the Department and the Dam owner.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.446, 540.464, 540.488

690-020-0026
Fees
(1) The Department may charge a fee for examination of the site, plans and specifications, features, and other supporting information regarding construction of a new Dam or construction to modify Dam Height. The fee, as provided in ORS 540.449, must be paid prior to final design approval and may not exceed the lesser of the costs of providing the examination or the amounts provided in ORS 540.449(3).

(2) Dam owners subject to the Department's laws governing Dam safety shall submit to the Department an annual fee based upon the Dam's Hazard Rating as provided in ORS 536.050(2) to support the Dam Safety Program and administration expenses.

(a) Dam owners who fail to pay the annual fee on or before six months after the billing date may be required to pay a late fee as provided in ORS 536.050(2).

(b) If a Dam owner fails to pay the annual fee or late fee charged by the Department, the Department may, after giving the Dam owner notice by certified mail, place a lien on the real property where the Dam is located for the fees owed by the Dam owner.

(c) Multiple Dams directly adjacent to each other and connected together and separated only by Embankments or other manmade materials will be considered as one Dam for the purpose of determining annual fees.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 536.050, 540.449

690-020-0028

Preliminary Plans and Specifications for Construction of New Dams or to Increase Dam Height

(1) If a Dam requires a Water right, preliminary plans and specifications must be submitted to the Department at the time an application to appropriate Water is submitted to the Department pursuant to ORS 537. Preliminary plans and specifications are recommended for Dams that do not require a Water right.

(2) Preliminary plans and specifications must include the following at a minimum:

(a) A contour map of the reservoir site showing the proposed location of the Dam. The map should be no smaller than 11" X 17". The map must show the proposed location of the Spillway(s) and the Conduit inlet and outlet;

(b) Written description of the proposed Dam location both as Latitude/Longitude and Township/Range/Section;

(c) A cross section of the proposed Dam at the maximum section indicating the proposed Height;

(d) The proposed storage of the reservoir in Acre-feet; and

(e) A brief description of geologic conditions of the proposed site. Any geologic features that could impact the safety of the Dam should be clearly described.

(3) The preliminary plans and specifications must be submitted by an Engineer, or a certified engineering geologist that is registered in the State of Oregon and is also a Certified Water Rights Examiner.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 537.400

690-020-0035

Minimum Engineering Requirements for Final Design of New Dams or to Increase Dam Height

(1) Final documents must be submitted by the Engineer of Record prior to construction to build a new Dam or increase Dam Height as required in OAR 690-020-0080. Design reports may be completed by Engineers other than the Engineer of Record. If multiple reports are submitted, each must be stamped by the Engineer who prepared the report.

(2) Final documents shall include:

(a) A plan for construction administration as provided in OAR 690-020-0065;

(b) An operations and maintenance plan if required by OAR 690-020-0350;

(c) An Emergency Action Plan for Dams rated High Hazard as provided in OAR 690-020-0400;

(d) Final design drawings as provided in OAR 690-020-0055; and

(e) Final design reports.

(3) The final design report(s) must include the following elements:

(a) Site suitability evaluation as provided in OAR 690-020-0036;

(b) Hydrology and Inflow Design Flood as provided in OAR 690-020-0037;

(c) Dam structure design as applicable and as provided in OAR 690-020-0038–690-020-0041;

(d) Spillway design as provided in OAR 690-020-0042;

(e) Design for penetrating Conduit(s) as provided in OAR 690-020-0043;

(f) Monitoring and instrumentation for determining whether a Dam is operating properly based on the Hazard Rating of the Dam as provided in OAR 690-020-0044; and

(g) A Dam Breach Inundation Analysis as provided in OAR 690-020-0120.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0036
Design Requirements for New Dams or to Increase Dam Height: Site Suitability and Geotechnical Evaluation
The design to build a new Dam or to increase Dam Height shall characterize the soil and rock at and around the Dam site and shall include the following elements:

(1) A description of the general and local geology and geomorphology at and around the proposed Dam and reservoir site;

(a) Field investigation by a geotechnical Engineer or engineering geologist or both is required for Dams rated High Hazard. For Dams rated Significant Hazard, field investigation by a geotechnical engineer or engineering geologist or both is required where landslides, faults, dispersive soils, or liquefiable soils could reasonably be expected near or at the Dam site. All such features shall be shown on a map of the Dam site and be described as necessary for design of the Dam;

(b) For Dams on located on rock, a drawing must also contain mapping of discontinuities relevant to the safety of the Dam and include evaluation of whether grouting is required;

(2) A subsurface investigation to determine the distribution of relevant earth materials, which shall include borings or test pits; identification of springs, seeps, and groundwater encountered at the Dam site; and evaluation of the potential for landslides into the Dam or reservoir;

(a) All materials shall be logged by the Unified Soil Classification System; blow counts (for borings only); and include a description of samples taken for testing;

(b) Subsurface investigations for High Hazard Dams shall include drilling to a minimum depth of 1.5 times the Dam Height or at least ten feet into bedrock, whichever is less;

(3) An evaluation of soil and rock and the testing of relevant materials, which may include: proctor compaction testing from all borrow areas, estimation or testing the permeability of soils to be used in Dam construction, and an assessment for the presence of dispersive soils. There must be a sufficient number of tests to characterize the variability in each borrow area. In addition, an evaluation must contain the following information as applicable and as may be required by the State Engineer:

(a) An analysis of materials in the Foundation and proposed Embankment if materials are prone to liquefaction or significant settlement;

(b) Where suitable materials can be collected, strength tests shall be required for all High Hazard Dams, and may be required by the State Engineer for Significant Hazard Dams;

(c) Testing of dynamic soil properties may be required for High Hazard Dams in areas with large ground acceleration potential from earthquake loading, if soils have potential for significant strength loss upon seismic loading;

(4) Borrow area locations. Areas proposed for borrow shall be identified and shown on the drawings;

(5) Earthquake considerations. Seismic site characterization is required for High Hazard Dams, and may be required for Significant Hazard Dams. A seismic site characterization shall include earthquake sources, ground motion hazard, peak ground acceleration, and recommended ground motions (time histories); and

(6) Site preparation criteria. The site evaluation shall recommend a depth of stripping unsuitable materials, and also a minimum, and where necessary, maximum depth for the Cutoff Trench.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0037
Design Requirements for New Dams or to Increase Dam Height: Hydrology and Inflow Design Flood

The design to build a new Dam or to increase Dam Height shall characterize flow into and through the reservoir and the Dam and shall include the following elements:

(1) A topographic map delineating the drainage area contributing to the Dam, with the drainage area size labeled in square miles and showing the specific location of the proposed Dam;

(2) For Dams on stream channels, the name of the stream where the Dam is located, the name of the principal watershed, and a determination of average annual inflow into reservoir and potential to fill the reservoir;

(3) The Inflow Design Flood that is the basis of hydraulic design for the Dam shall be determined based on the Hazard Rating of the Dam as follows:

(a) The Inflow Design Flood for a High Hazard Dam is the Probable Maximum Flood (PMF) unless the Engineer of Record proposes to determine an Inflow Design Flood based on a quantitative analysis of risk to people;

(b) The minimum Inflow Design Flood for a Significant Hazard Dam is the 0.2 percent Annual Exceedance Probability Flow;

(c) The minimum Inflow Design Flood for a Low Hazard Dam is a 1.0 percent Annual Exceedance Probability Flow;

(d) The Inflow Design Flood for a lagoon or off channel reservoir is the maximum capacity of inflow pumps or ditches plus the maximum local storm precipitation over the lagoon; and

(e) For watersheds under 30 square miles, the Engineer of Record may consider just the 24-hour storm to help determine the PMF, while for larger basins the Engineer of Record shall utilize at least a 72-hour storm for calculating the PMF for a general storm;

(4) Designs shall include a description of all hydrologic parameters and the method used to determine the Inflow Design Flood hydrograph and the volume of the Inflow Design Flood, which is to be determined considering basin size and other factors as appropriate to the watershed above the Dam; and

(5) The design report must include the information used to develop the stage and storage capacity curve for the reservoir, including the capacity with and without excavation for construction.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0038
Design Requirements for New Dams or to Increase Dam Height: Embankment Dam Structures
Designs to build a new Dam or to increase Dam Height for Embankment (soil or rock) Dams shall include the following elements:

(1) A determination of Embankment stability and stable Embankment slope angles as follows:

(a) Embankment Dams shall be designed to have stable slopes during construction, and under all conditions of reservoir operation;

(b) Standard slopes of 3:1 upstream and 2:1 downstream may be used at the discretion of the Engineer of Record for Low and Significant Hazard Dams as long as low strength materials are not used in the Embankment and conditions leading to elevated pore Water pressures are not present;

(c) For High Hazard Dams, an analysis of static and seismic slope stability, and of deformation. The State Engineer may require static and seismic slope stability analysis for Significant Hazard Dams. At a minimum, seismic analysis shall be based on full reservoir under steady state seepage conditions. Factors of safety shall be evaluated by slope stability analyses using appropriate strength parameters based on laboratory or in situ testing. For materials that can be reasonably tested either on site or in a laboratory, soil strength values may not be based on assumptions and must be made on strength testing of the appropriate soil or rock units;

(d) High Hazard Dams shall be designed for the maximum credible earthquake. If the State Engineer requires seismic analysis of a Significant Hazard Dam, deformation analysis shall be designed for the 0.2 percent Annual Exceedance Probability earthquake; and

(e) Abrupt changes in depth of compressible Foundation material shall be identified and where present, the design shall prevent significant differential settlement;

(2) Analysis of seepage and leakage expected through the Dam and design of measures to prevent internal erosion and excess leakage as follows:

(a) Steady state seepage and internal drainage conditions beneath, around, and through the Dam shall be quantified for all High Hazard Dams, and may be required by the State Engineer for Significant Hazard Dams;

(b) A Core of low permeability material protected by a Soil Filter is required for all High Hazard Dams. A Core and Soil Filter is required for any Significant Hazard Dams where the Engineer of Record or State Engineer determines piping could potentially occur. All Core and filter zones must be of a configuration with dimensions that can be readily constructed;

(c) Internal drains and Soil Filters shall be used as needed to drain Water and prevent internal erosion of the Dam. Toe Drains shall be standard design practice for Water storage Dams, but not for most wastewater lagoons; and

(d) Internal drain pipes to collect and distribute seepage flows from internal filters and drains shall be comprised of material that is non-corrodible, designed to carry the overburden load, and be no smaller than six inches in diameter;

(3) A safe and accessible Crest as follows:

(a) The Crest shall be of sufficient width to be accessible by equipment and vehicles for emergency operations and maintenance, and shall have a road to allow Crest access during periods when the Spillway is flowing;

(b) The Crest shall have a camber sufficient to maintain the design Freeboard, based on the anticipated Crest settlement, and in no case shall the camber be less than 0.5 feet;

(c) Roads located on the Crest shall have appropriate surfacing to provide a stable base that resists rutting and provides adequate traction for access and safety in wet conditions; and

(d) The Crest shall have adequate cross slopes to prevent ponding;

(4) Measures to control wave and surface erosion as follows:

(a) For reservoirs large enough to generate significant waves, the design shall include a determination of minimum Freeboard based on expected waves. The design shall also include slope protection for wave action if significant waves are likely; and

(b) The downstream slope shall be provided with non-woody vegetative cover, or a gravel or rock surface, to prevent surface erosion.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0041
Design Requirements for New Dams or to Increase Dam Height: Concrete Dam Structures
Designs to build a new Dam or to increase Dam Height for concrete mass Dams must be prepared by a structural Engineer and a geotechnical Engineer or engineering geologist. This rule does not apply to concrete flashboard Dams. Designs for all other concrete Dams shall include the following elements as applicable:

(1) Concrete Dams shall be specified as gravity, arch, arch-gravity, or buttress. Gravity Dams can be of conventional mass concrete or roller compacted concrete;

(2) Dams shall be designed to be stable during construction and under all conditions of reservoir operation;

(a) Headwater and tailwater elevations pertinent to the design shall be described with respect to both static and dynamic loading;

(b) Uplift pressure distributions assumed for design shall be provided; and

(c) When Foundation drains are used to reduce uplift, the assumed drain efficiency shall be indicated and permanent access shall be provided at the project to inspect and maintain the drains;

(3) Sliding stability shall be evaluated at lift joint surfaces, at the Dam Foundation interface, and at discontinuities in the Foundation materials beneath the Dam and Abutments;

(a) Factors of safety shall be based on limit equilibrium methods;

(b) For earthquake loadings, a permanent sliding displacement may be determined in lieu of a sliding factor of safety; and

(c) Overturning of the Dam on its Foundation shall be evaluated for static and seismic loading;

(4) Seismic stability analysis may be required for Concrete Dams and if required shall demonstrate the Dam can withstand the design earthquake without loss of life or damage to property or public infrastructure;

(a) High Hazard Dams shall be designed for the maximum credible earthquake based on current information from the US Geological Survey or a site specific seismic evaluation. A dynamic stress analysis that considers the dynamic characteristics of the Dam and the ground motions of the design earthquake shall be provided for High Hazard Dams; and

(b) Where the State Engineer requires seismic analysis on Significant Hazard Dams, they shall be designed for the 0.2 percent Annual Probability of Exceedance earthquake. The Department may require a dynamic stress analysis for Significant Hazard Dams;

(5) When Foundation grouting is needed, the design for the grout curtain and consolidation grouting of the Foundation shall be described;

(6) Any property essential for the structural design of the concrete shall be included in the design documents. These may include, but are not limited to, compressive strength (at 28 days and one year), modulus of elasticity, Poison’s ratio, shear strength, tensile strength, volume change during drying, thermal coefficient of expansion, specific heat, thermal conductivity, permeability and durability;

(a) As a minimum for static loadings, the assumed compressive and shear strengths for the parent concrete, lift joint surfaces, and the Dam Foundation contact shall be provided;

(b) In addition, tensile strength assumptions for the aforementioned regions for dynamic loadings (seismic) shall also be provided; and

(c) Air entraining agents shall be provided in the concrete mix to provide freeze-thaw protection and to improve the workability of lean mass concrete mixes. The quantity of air entrained in mass concrete shall be in the order of five percent;

(7) Mix design and construction methods used to minimize cracking due to temperature gradients between interior regions subject to heat of hydration effects and surfaces exposed to ambient temperatures shall be specified. Treatment of lift joint surfaces to achieve desired shear and tensile strengths shall be indicated. Treatment of contraction joints to prevent leakage or to transfer load between adjacent monoliths shall be described;

(8) When reinforcing steel is used, the strength properties of the reinforcement shall be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements; and

(9) The minimum Crest width must be 15 feet unless otherwise approved. The Crest and appurtenant structures shall be accessible by equipment and vehicles for emergency operations and maintenance.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0042
Minimum Design Requirements for New Dams or to Increase Dam Height: Spillways
(1) Dams on stream channels and all High Hazard Dams must have a Spillway.

(2) Spillway(s) design to build a new Dam or to increase Dam Height shall include the following minimum elements:

(a) Utilization of Inflow Design Flood. Determination of Inflow Design Flood as described in OAR 690-020-0037 is required to determine the required Spillway capacity;

(b) Hydraulic evaluation of flow through control section. Flood flow through the control section must be calculated and the minimum Freeboard at the Inflow Design Flood must be one foot for High Hazard Dams and two feet for Significant and Low Hazard Dams;

(c) Optional low elevation Spillway. An interior Spillway connected to the low level Conduit may be used for Low and Significant Hazard Dams, and for High Hazard Dams only with specific approval by the State Engineer. The capacity of the low elevation Spillway may be considered in design of the overflow Spillway;

(d) Stable Spillway control section. The Spillway control section must be hydraulically and structurally stable for the Inflow Design Flood and have permanent features so that the control section is identifiable for re-measurement of cross section during routine inspections;

(e) Spillway channel stability. Spillways shall be designed to be structurally adequate and stable under all conditions of reservoir operation. Spillway structures of High Hazard Dams shall be designed for earthquake ground motions per OAR 690-020-0036;

(f) Reinforced concrete specifications for spillways. Structural elements of reinforced concrete shall be designed for both strength and serviceability. The 28 day strength of structural concrete shall be provided. The strength properties of the reinforcing materials shall also be provided and contract drawings shall clearly indicate the size, location, spacing, and cover requirements. Treatment of construction joints and contraction/expansion joints shall be described and special provisions for strength transfer and leakage prevention identified. Air entrainment shall be provided in cast-in-place concrete if needed for freeze-thaw protection, durability, and workability;

(g) Debris booms. For High and Significant Hazard Dams, debris or log booms may be required. Where required, they shall be designed for the Spillway approach where logs and other debris may block or damage the Spillway structure. The design shall specify the necessary anchor capacity, and the design of the anchors;

(h) Gates and Flashboards. Detailed drawings and specifications are required for Spillway Gate structures or flashboards, if present on the proposed Dam. Operations and maintenance plans are required for any Dam with a Gated Spillway, or where flashboards or stop-logs are used in the Spillway as per OAR 690-020-0350; and

(i) Energy dissipation. The design of stilling basins for High Hazard Dams, and where required by the State Engineer for Significant Hazard Dams, shall be based on calculated hydraulic forces and designed to dissipate energy and minimize scour and erosion from the Inflow Design Flood.

(3) Low and Significant Hazard Dams constructed off channel are not required to have a Spillway, if redundant mechanisms to prevent overfilling are included in the design.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0043
Design Requirements for New Dams or to Increase Dam Height: Penetrating Conduit(s) and Control of Flow through Conduits
New Dams on stream channels must have a low level Conduit. All other new Dams and Dams with increases to Dam Height must have a low level Conduit or other means to safely drain the reservoir. The Conduit and related control structures must be designed to meet the following criteria:

(1) Ability to lower the reservoir. The minimum diameter of the Conduit should be determined through analysis of the time required to drain the Dam at average annual inflow;

(a) The Conduits for High Hazard Dams shall be capable of releasing the amount of Water which could be stored in the top five feet of the reservoir in five days;

(b) The Conduits for Significant and Low Hazard Dams must be able to release the amount of Water which could be stored in the top five feet of the reservoir in ten days;

(c) All Conduits must be of sufficient size to allow passage of inflows as needed;

(d) In no case shall Conduits be smaller than eight inches in diameter;

(2) Durable and water-tight Conduits. Conduits must be made of medium to heavy gage durable materials. Pipe joints must be designed to seal and prevent leakage. Corrugated metal culverts are only acceptable for Low Hazard Dams, and only when the Conduits are encased in concrete. Encasement of Conduits in concrete may be used to assist in the design of a durable Conduit and to reduce the potential for seepage and erosion adjacent to the Conduit;

(a) Diaphragms using materials designed as an effective Soil Filter are required for any Conduits not designed as encased in concrete, and are required regardless of encasement for all High Hazard Dams;

(b) Seepage collars may not be used;

(3) Control Mechanisms. The design for the control mechanism must be sturdy and durable. The control mechanism must allow for air venting when needed, and allow manual operation to drain the reservoir if hydraulic or other power controls are inoperable. Hydraulic or other power controls must have redundancy if control relies on any submerged hydraulic or pneumatic hoses or electrical conduits. Intake structures for outlet works must have trash racks unless the Engineer of Record shows trash racks are unnecessary, or not safe to construct due to conditions at the Dam site. For High and Significant Hazard Dams, measures to prevent unauthorized use of the control mechanism must be included in this design;

(4) Outlet structure. The outlet structure must not be submerged when the inlet control Gate or Valve is fully closed. The outlet structure must be designed to protect the Conduit from mechanical damage and convey Water to the stream channel without channel erosion and cavitation near the Gate structure; and

(5) Pressurized operation. Conduits must be specified as suitable for pressurized operation if they are to be operated with controls other than at the inlet of the Conduit. Dams with Pressurized Conduits shall have a guard Gate installed at the upstream end of the Conduit. Operations and maintenance plans are required for any Dam designed for pressurized operation as per OAR 690-020-0350.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0044
Design Requirements for New Dams or to Increase Dam Height: Instrumentation for Monitoring
Designs must include methods for determining if the Dam is operating properly based on the Hazard Rating of the Dam, and include:

(1) A plan to share monitoring data with the Department;

(2) Staff gage near controls for the Conduit or where they can be easily seen by the Dam owner or operator. The staff gage shall be clearly marked in feet and tenths of feet, and extend to within one foot of the Crest. Markings and numbers on the gage rod shall be of sufficient size to be easily readable from the Crest;

(3) Multiple and easily accessible outlets of all Toe Drains. Toe Drains shall be designed to discharge into locations where flows can be evaluated and monitored. Multiple discharge points are required in order to isolate seepage to various sections of the Dam and Foundation. Discharge points must be located where routine Dam maintenance is not likely to damage the drains;

(a) For High Hazard Dams, drains must have a measuring weir or other device, and a basin for settling drainage Water so that internal erosion can be identified;

(b) Where drainage galleries are provided for concrete Dams, seepage measuring devices should be provided and accessible for making the necessary readings;

(4) Unique Identification. All instrumentation and exterior drains shall be labeled with a unique identifying marker designed for durability and to withstand maintenance activities; and

(5) All High Hazard and, when required by the Engineer of Record or State Engineer, Significant Hazard Dams shall have the following instrumentation:

(a) Monuments that allow measurement of the horizontal and vertical movements of the Dam. Control or benchmark monuments shall be placed in areas not subject to movement;

(b) Piezometers to allow monitoring of the phreatic surface within the Dam or for concrete Dams, to determine uplift pressures. Standpipe piezometers must be installed pursuant to monitoring well standards per OAR 690-240-0525;

(c) Instrumentation to measure strong ground motions for publically owned Dams in locations where the peak ground acceleration in the 0.2 percent Annual Probability of Exceedance earthquake is greater than 0.3g at the ground surface.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0047
Design Requirements for New Dams or to Increase Dam Height: Geosynthetics
Geosynthetics shall not be used as the sole element employed to perform a Dam safety function. Redundant design features are required whenever geosynthetics are used for Dam safety functions.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0048
Exceptions to Standard Design Requirements
Exceptions to design standards may only be obtained with written approval from the State Engineer. Where the Engineer of Record requests design exceptions, the request must be in writing, be affixed with the Engineer of Record professional stamp, and include a report describing why design standards are inapplicable to the safety of the Dam.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0055
Design Requirements for New Dams or to Increase Dam Height: Design Drawings
The Engineer of Record shall submit applicable drawings when the Engineer believes the design is ready for review and approval by the State Engineer.

(1) Drawings must accurately portray the work to be accomplished and be of sufficient detail to clearly define all features of the project. After all changes required by the State Engineer are made, final design drawings must be neatly and accurately drawn to a scale sufficiently large for the drawings to be readily interpreted.

(2) Drawings must be uncluttered and easy to understand for determination of design compliance by the contractor, the Engineer of Record, and the State Engineer.

(3) Drawings must be no larger than 24” X 36”. Other acceptable sizes for drawings are 17” X 22” and 22” X 34” All drawings must have a graphic scale bar so that scale can be determined after enlargement or reduction. Each sheet shall be numbered sequentially with the first sheet being sheet number one along with the total number of sheets; e.g., 1 of 6.

(4) Drawings shall include the following information:

(a) An official Dam name, which must not have already been used for a Dam as indicated in the Oregon Dam Safety Database. This unique name must be affixed on each drawing;

(b) The first drawing must include a location map with the drainage basin, the Dam and reservoir, streams within the drainage area, and the location of the nearest access highway. This drawing must include legal location of the Dam including Section, Township and Range, and the location of the survey reference point with latitude, longitude, elevation, and datum elevation in NAVD1988;

(c) A contour map of the reservoir site showing the legal location of the Dam with a contour interval no greater than five feet. A plan of the Dam should be superimposed on this map. If scale permits, this drawing should show the location of the Spillway(s), Conduit inlet and outlet, and the location, distance and direction to a government land corner or other permanent survey marker;

(d) An area capacity curve showing the total capacity to the Crest, with the Spillway invert elevation identified. Surface area and storage capacity curves must be in acres and Acre-feet, respectively;

(e) A profile of the Dam site at the center of the Dam;

(f) A cross section of the Dam at maximum section;

(g) Plan view(s) of Dam at maximum section, and other sections as needed;

(h) Cross section(s) of Dam, including the maximum section with the official Dam Height;

(i) Spillway details, Spillway approach control discharge, and energy dissipation;

(j) Low level Conduit details, including diameter, material, encasement; and

(k) Slide Gate or Valve details including the trash rack, control stem, pedestal and wheel, or other control details, and air vent.

(5) Elevations must be clearly labeled on applicable drawings and include the:

(a) Base of Dam and official Dam Height;

(b) Crest;

(c) Spillway control section;

(d) Base of Spillway discharge; and

(e) Invert of the Conduit at both the inlet and outlet.

(6) All drawings must be dated and have sufficient space for State Engineer's approval stamp, at least 3" x 3" near the lower right hand corner of the drawing.

(7) Drawings must be designated as final design drawings or As-built Drawings.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0060
Design Requirements for New Dams or to Increase Dam Height: Construction Specifications
All drawings for Dams must be accompanied by construction and material specifications that include the following:

(1) Construction conditions. Specifications must include the construction period based on typical weather and stream conditions for that location and if applicable, may include a process for the Engineer of Record to modify the construction period;

(2) Clearing of the Dam site and reservoir. Specifications must include the area to be submerged by the new or enlarged reservoir and specify that the submerged area shall be cleared of logs and debris prior to filling the reservoir. The specifications must require that the footprint of the Dam shall be cleared of all soils containing organic materials, and that this material may not be used for Dam construction;

(3) Cutoff Trench requirements. Specifications must include the minimum trench depth, width at base of the trench, and maximum side slope steepness. These specifications shall be based on the subsurface investigations and direct that the Cutoff Trench may not be filled if it contains standing Water.
Specifications must also include a requirement not to begin filling the Cutoff Trench until approved by Engineer of Record, and where specified, approved by the Department;

(4) Material specification standards. The specifications shall include material and testing specifications for Dam materials, Conduits, control structures, and other appurtenant structures, using an ASTM standard methodology if available;

(5) Soil Compaction. The typical compaction specification is 95 percent of standard proctor density, though the Engineer of Record may use a different compaction standard. Specifications shall include the types of acceptable compaction equipment, by material source if necessary. Specifications shall also include maximum lift thickness. Specifications shall prohibit soil compaction dry of optimum moisture content to reduce potential for leakage around the Conduit. For materials placed immediately above or adjacent to the Conduit, specifications must also include verification testing of soils, with representative samples selected for testing as directed by the Engineer of Record. Specifications must also require verification of testing of soil compaction, with representative samples selected for testing by the Engineer of Record, or Engineer's representative;

(6) Concrete placement. Specifications shall include means to prevent separation of aggregate and cement, air entrainment requirements if needed, methods for placement and vibration of concrete, required minimum 28 day strength, slump, moisture and temperature requirements for curing. Alkali reactive aggregate shall not be used in the concrete;

(7) Conduit specifications. Specifications must include the material, diameter, and thickness of the Conduit, and the length of Conduit required for the project. Methods for sealing joints must be specific. Specifications must require that all materials from a manufacturer are certified to meet this test, or that the Engineer of Record has tested the materials directly;

(8) Accepting and Rejecting Materials. Specifications must include tolerances for acceptable departure from material specifications and a process for rejection of defective materials or workmanship;

(9) Notification by the Engineer of Record to the State Engineer of changed conditions critical to the safety or operations of the Dam. Specifications shall include State Engineer notification if previously unidentified springs, slope movement or sand lenses are identified, or if storm or other damage occurs during construction;

(10) The Engineer of Record or their qualified employees must supervise construction as needed to assure compliance with the approved construction plans and specifications; and

(11) The specifications must also contain a provision to the effect that plans or specifications shall not be altered or changed without the written approval of the State Engineer.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0065
Plan Requirements for New Dams or to Increase Dam Height: Construction Administration
The Engineer of Record shall submit plans for administering the construction of the Dam to the State Engineer for approval. Construction plans must include the following:

(1) A provision stating that the Engineer of Record or an employee working for the Engineer of Record shall be on-site as needed for instructions to the contractor, approval of initial excavation, acceptance of materials, and general project administration;

(2) A provision stating that the Dam owner shall cease construction activity if the Engineer of Record is no longer retained or for any reason cannot complete necessary construction administration activities. Construction may resume when a new Engineer of Record is employed, the State Engineer has been notified of the new Engineer of Record, and both Engineers have discussed the project;

(3) A provision stating that the Engineer of Record will observe the Dam during construction as needed to determine if construction is consistent with approved design and construction documents. This provision shall also include a description of how the Engineer of Record will determine if construction work in progress fails to conform to the approved plans and specifications, and that such nonconforming work will be corrected;

(4) A provision stating that the Engineer of Record shall confirm Foundation design assumptions once surface materials have been stripped and the Cutoff Trench excavated. Changes in actual Foundation conditions from assumptions made in the initial site evaluation shall be communicated to the State Engineer;

(5) A provision in which the Engineer of Record shall maintain a record of construction that shall include:

(a) Logs of construction inspections whenever such inspections are made by the Engineer of Record or the Engineer of Record's employee;

(b) All test results pertaining to construction;

(c) Photographs; and

(d) Construction problems and remedies; and

(6) A provision stating that the Engineer of Record shall complete and stamp As-built Drawings and a final construction report, including statements that the observations are either consistent or inconsistent with the design drawings and specifications. If key elements of construction were not observed, the construction report shall detail those specific elements that were not observed.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0068
Plan Requirements for New Dams or to Increase Dam Height: Operations and Maintenance Plan
(1) The Engineer of Record shall include an operations and maintenance plan with the submittals for building a new Dam or increasing Dam Height for:

(a) Any Dam rated Significant or High Hazard; and

(b) Any Low Hazard Dam with:

(A) A Gate or flashboard as part of the Spillway; or

(B) A Valve on a Conduit that is not on the upstream side of the Dam.

(2) The Department may review implementation of the operations and maintenance plan during Dam safety inspections.

(3) Operations and maintenance plans shall include, but are not limited to:

(a) Directions for filling and emptying the reservoir when needed;

(b) Frequency of inspection of the interior of Conduits, including qualifications and guidance for Persons conducting and reporting on this inspection;

(c) Procedures for operation of all Gates and Valves;

(d) Specified minimum frequency for cycling and lubrication of all Gates and Valves;

(e) Standards for removal of trees and brush, and mowing other vegetation; including the frequency for the Dam owner to monitor vegetation and to take action to control brush if it obscures any face of the Dam, the Conduit, or the Spillway;

(f) Frequency of routine Dam observations, including identification of changes in seepage and maximum permissible Dam deformations;

(g) A Water release plan in the event of a flood forecast when reservoir is above the maximum safe operating level established by the Engineer of Record;

(h) The measurement frequency for all monitoring instrumentation installed at the Dam; and

(i) Review and evaluation of conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, including actions identified in OAR 690-020-0250.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.488

690-020-0070
New Dams or to Increase Dam Height: Submittals and Notifications by the Engineer of Record
(1) The Engineer of Record must include an inundation analysis that complies with OAR 690-020-0120 prior to submitting the design report, plans and specifications and other documents, so that the Department can determine the Hazard Rating of the Dam.

(2) All final designs, drawings and specifications submitted to the State Engineer for approval must be prepared and stamped by an Engineer. The first page of the drawings, the specifications, and the construction administration plan must be stamped by the Engineer of Record. All submitted materials must be addressed directly to the State Engineer and labeled as a Dam safety submission.

(3) Final drawings shall be submitted on full size paper. The design reports and specifications must be submitted as packaged 8.5” x 11” bound documents, with maps folded within.

(4) For High Hazard Dams, the final Emergency Action Plan and any additional inundation analysis required for the EAP as described in OAR 690-020-0400 must be submitted by the Dam owner, or the Engineer of Record on behalf of the Dam owner, prior to commencing construction.

(5) A schedule of construction shall be provided to the State Engineer prior to initiating construction of any Significant or High Hazard Dam.

(6) The Engineer of Record shall notify the State Engineer to allow for Department inspection of the excavation prior to completion of the Cutoff Trench and all stripping of Foundation and Embankments. The required notice to the State Engineer is as follows:

(a) 48-hours for a Low Hazard Dam;

(b) 120-hours for a Significant Hazard Dam; and

(c) 240-hours or the time specified in the approval, whichever is longer, for High Hazard Dams.

(7) Any changes made to the designed location, Height or width of the Dam, or to materials used in Dam construction shall be reported in writing immediately to the State Engineer.

(8) Any slope instability observed during construction in the Embankment or adjacent to the Dam or into the reservoir, shall immediately be reported to the State Engineer by phone.

(9) The Engineer of Record must immediately notify the State Engineer if they are no longer the Engineer of Record. The notification shall be by phone and in writing.

(10) The Engineer of Record must submit a project completion report upon completion of the Dam. A project completion report must include the following:

(a) As-built Drawings. If possible, As-built Drawings shall be on the same sheet as the initial design drawings;

(b) Sufficient information to document that the Dam has been built according to the drawings with changes to improve safety as documented in the As-built Drawings, or that critical safety functions are unknown;

(c) A list of the dates the Engineer of Record was on site, the number and location of material tests, and observations of all changed conditions;

(d) Material testing results (compaction, strength, permeability);

(e) Observations and decisions made and communicated to the contractor or Dam owner;

(f) Photographs of key stages of construction, including, but not limited to, photographs of the Cutoff Trench, borrow pit development, trenching and placement of the Conduit, the Spillway before and after placement of concrete; and

(g) The signed professional stamp of the Engineer of Record.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.488, 540.449

690-020-0080
New Dams, or to Increase Dam Height, Written Approval by State Engineer
(1) No person shall build a new Dam or increase Dam Height unless the State Engineer has reviewed all necessary reports, drawings, plans and other information as submitted by the Engineer of Record and has approved those documents as indicated in written communication with the Engineer of Record.

(2) Prior to commencing construction activity, the Engineer of Record shall verify that all necessary documents related to the final design as identified in OAR 690-020-0035 are approved as indicated by the State Engineer's stamp on those documents.

(3) The State Engineer's approval of design plans and specifications shall be valid only for five years from the date of approval. Upon request, written requests for time extensions may be granted in writing by the State Engineer.

(4) No newly constructed Dam or Dam that has had Height modified may store Water until final written acceptance of a satisfactory project completion report has been submitted to and accepted by the Department.

(5) The Department shall notify the Engineer of Record and Dam owner in writing when the final project completion report has been received and accepted by the Department.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.488, 540.449

690-020-0100
Hazard Rating of Dams
(1) The Department shall assign all Dams a Hazard Rating of High, Significant, or Low.

(2) A High Hazard Rating will be based on the Dam breach inundation analysis as described in OAR 690-020-0120 using the following criteria to determine expected loss of life:

(a) An inundation depth of flowing Water of at least two feet over the finished floors of dwellings, other frequently occupied buildings, or road surfaces where a vehicle is likely to be present is likely to result in loss of life. The Department may also consider Water velocity in its determination of inundation depth establishing a High Hazard Rating;

(b) An incremental increase of depth of flowing Water of one foot where recreational or other frequent use occurs downstream is likely to result in loss of life. The Department will also use Water velocity in its determination of inundation depth establishing a High Hazard Rating;

(3) A Significant Hazard Rating will be based on the Dam breach inundation analysis as described in OAR 690-020-0120, using depth and velocity of the flowing Water at affected structures, public infrastructure, and other properties which shows likely damage to property and infrastructure but no loss of life.

(4) Any Dam subject to regulation under these rules that is not rated as High or Significant by the Department will be rated as Low Hazard.

(5) The Hazard Rating of a Dam shall remain in effect until the rating is revised by the Department. The Department may conduct Hazard Rating reviews and dam breach inundation analyses as evidence indicates the impacts to people, property, or infrastructure may have changed since the Hazard Rating was first set. The Dam owner will be notified of the change and have an opportunity to meet with the Department and obtain records of the Department's analyses.

(6) A Dam owner may request that the Department consider revision of a Hazard Rating. The owner may have an Engineer prepare and submit a Dam breach inundation analysis, in support of this request.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.488

690-020-0120
Dam Breach Inundation Analysis
(1) A Dam breach inundation analysis will be conducted as specified in this section to determine or revise the Hazard Rating of a Dam.

(2) Any simplified and conservative hydraulic model may be used for the Dam breach inundation analysis to show that a Dam should be rated Low Hazard. The State Engineer may determine if the model was used appropriately and conservatively.

(3) An accepted and hydraulically consistent computational model must be used to conduct the inundation analysis for Significant and High Hazard Dams.

(4) A report summarizing the model information and results must be stamped by the Engineer. The summary report shall contain sufficient information to reproduce the model and shall include at a minimum the following information:

(a) The specific proprietary model name or method used for the analysis;

(b) Details regarding the model geometry;

(c) The specific mode of failure and any assumptions made in the selection of the mode of failure;

(d) A list of Dam breach parameters and any assumptions made in the selection of the breach parameters. The breach parameters must be based on Dam material and thickness and any other factors that would influence the time it would take for the Dam to breach from internal erosion, overtopping, or displacement;

(e) A list of all boundary and initial conditions and any assumptions in the selection of these conditions. For High and Significant Hazard Dams, the analysis must be conducted with reservoir at full pool and inflow equal to the 0.2% Annual Exceedance Probability Flood flow;

(f) A map indicating the inundation boundary, areas inundated by a depth greater than two feet, and all frequently occupied structures that fall within or are immediately adjacent to the inundation boundary;

(g) The breach flow as calculated by the model immediately downstream of the Dam. If an empirical formula was used as the basis for determining breach flow, the formula and all inputs must be clearly stated; and

(h) A sensitivity analysis evaluating the variability in model inputs may be required when the Dam breach inundation analysis results indicate the Hazard Rating is on the border between two ratings.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.488

690-020-0140
Modification of Dams
(1) No Person shall make Modifications to a Dam unless the State Engineer has reviewed all required documents as described in this section and has approved those documents as indicated in written communication with the Engineer of Record or Dam owner.

(2) The following Dam Modifications require State Engineer approval of plans:

(a) Changes to or near the Spillway that may affect Spillway capacity or ability to pass flows safely;

(b) Placing, replacing, or relining any Conduit within the Dam;

(c) Removal or alteration of the Conduit control structure;

(d) Installation of a new Valve on the downstream side of the low level Conduit;

(e) Correction of damage where that damage has impacted the safe functioning of the Dam;

(f) Any activity where 10 percent or more of the fill material in the Dam is disturbed; or

(g) Any other change to the Dam that results in a Modification as defined in OAR 690-020-0020(27).

(3) Dam Modification plans shall include all details of the area of the Dam being modified. Specific modification plan requirements include, but are not limited to:

(a) For major Spillway damage or alteration, plans need to address passage of the required Inflow Design Flood based on the Hazard Rating of the Dam, with the same criteria as required for new Dams in OAR 690-020-0037;

(b) For stabilization of slope movement, plans require slope stability analysis and appropriate corrective measures;

(c) For replacement of Conduits or installation of a Valve on the downstream side of a Dam, plans require an analysis of internal erosion potential;

(d) For internal erosion, plans must address construction of a filter zone; and

(e) Items required by the State Engineer pursuant to subsection (4).

(4) The Dam owner shall provide sufficient notice to the Department to allow for adequate time for discussion of the proposed Modifications and the necessary design requirements.

(5) The State Engineer will determine the design and submittal requirements. Submittal requirements and Department reviews may be expedited in the event of emergency or unanticipated weather-related situations.

(6) Water is not to be stored in the reservoir during modification. The Engineer of Record may propose maintaining some Water in storage during Dam Modification or modifying Dam Height if it is demonstrated that it can be done in a manner that protects life, property, and infrastructure. The Department will review submitted materials for the proposed construction actions. The Department may consider the scope of the project, including how the proposed construction actions will maintain safe Water levels through the duration of construction.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.443, 540.449, 540.488

690-020-0160
Removal
(1) Dam owner(s) seeking Removal of any Dam with a High or Significant Hazard Rating must notify the Department.

(2) Dam owner(s) shall provide the Department with a Removal plan for evaluation prior to removing the Dam. Plans must be submitted a minimum of 60 days in advance of Removal to allow reasonable time to evaluate the Removal plan, unless the Department agrees to a different timeframe.

(3) A Removal plan must include:

(a) Descriptions and assumptions for the Removal of the Dam;

(b) A description of the means for Removal of the Dam to prevent future impoundment and a method of draining the reservoir in a controlled manner prior to the start of the Removal;

(c) A schedule listing the major events and corresponding time frame that will occur during the Removal;

(d) A plan for disposal and stabilization of Dam material; and

(e) A drawing showing the planned Removal location, breach dimensions including side slopes, and lowest elevation of the breach. the Removal plan must show that there will be sufficient material removed and left at slopes that will allow no breach flood by erosion of remaining materials.

(4) The Department may evaluate the Removal plan to ensure the plan includes appropriate safety precautions to protect life, property, and public infrastructure from temporary inundation in the area below the Dam during Dam Removal.

(5) The Department may require changes to the Removal plan or require that the work performed under the plan be supervised by an Engineer as necessary to protect life, property, or public infrastructure from temporary inundation during Dam Removal. If the Department requires changes to the Removal plan or requires that work be supervised by an Engineer, the Department shall notify the Dam owner and provide an opportunity to meet with the Department.

(6) Upon completion of the Dam Removal, the owner shall notify the Department. The Department shall make a final inspection, if appropriate, and remove it from Department Dam safety oversight.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.452, 540.488

690-020-0180
Requirement of Owners to Provide Contact and Transfer of Title Information
(1) A Dam owner shall:

(a) Provide the Department with contact information for:

(A) The Dam owner;

(B) The operator of the Dam, if other than the owner; and

(C) The individual in immediate charge of the Dam.

(b) Provide the contact information in an Emergency Action Plan developed pursuant to OAR 690-020-0400, or in writing if no Emergency Action Plan exists.

(c) Notify the Department in writing of any changes in the contact information, as soon as practicable and without unreasonable delay.

(2) A Dam owner shall notify the Department in writing after completing a transfer of title for a Dam, as soon as practicable.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.479, 540.488

690-020-0250
Maintenance of Dams
(1) The Dam owner shall review and evaluate conditions of the Dam as necessary to keep the Dam in good repair and properly maintained, and address any detected conditions that may pose a risk of Dam Failure.

(2) Proper maintenance includes, but is not limited to:

(a) Removing brush and trees from the Dam;

(b) Control of burrowing animals, especially nutria near the Dam or reservoir, including filling deep burrows;

(c) Restoration of areas of surface or wave erosion, and taking measures to prevent future erosion;

(d) Adding or moving fill to restore Crest Height and width;

(e) Clearance of soil, rock, vegetation and debris from the Spillway;

(f) Proper cycling and lubrication of Valves and Gates at least once a year, unless otherwise specified in a maintenance and operations plan approved by the Department;

(g) Patching, sealing, or replacing areas of cracked concrete on the Dam;

(h) Removing debris, rock, or earth from the inlet and outlet of penetrating Conduits and drains;

(i) Repair or replacement of worn or damaged parts of Gates or Valves;

(j) Ensuring access to the Dam is sufficient for inspection, repair and emergency actions, and that unauthorized access is controlled;

(k) Securing operating equipment such as Valve controls and Spillway controls;

(l) Evaluation of the Conduit and taking necessary actions to ensure the Conduit is not compromised, including patching pipes with minor corrosion; and

(m) Addressing other conditions that might affect the safety of the Dam, including Maintenance Actions identified by the Department in an inspection document.

(3) Records necessary to track the conditions of the Dam should be maintained.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.455, 540.479, 540.488

690-020-0260
Inspection of Dams
(1) The Department, or representatives of the Department, may inspect a Dam and the site, plans and specifications, features and other supporting information regarding the construction, maintenance and operation of a Dam.

(2) The Department will maintain a Dam inspection schedule based on the Hazard Rating of the Dam:

(a) High Hazard Dams are scheduled for inspection annually,

(b) Significant Hazard Dams are scheduled for inspection every three years, and

(c) Low Hazard Dams are scheduled for inspection every six years.

(3) Notwithstanding subsection (2), the Department may determine that a different inspection schedule is appropriate. The Department may consider staff resources and Dam risks or condition in determining that a different inspection schedule is appropriate.

(4) The Department shall provide the Dam owner with an inspection document describing the general condition of the Dam and specific Maintenance Actions recommended by the Department.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.455, 540.467, 540.479

690-020-0310
Requirement to Address Maintenance Actions Need for High or Significant Hazard Dams
(1) If, as a result of an inspection of a Dam that is rated High or Significant Hazard, the Department concludes that Maintenance Actions are needed, the Department shall use the process contained in this section as outlined below.

(2) Upon inspection of a Dam that is rated High or Significant Hazard, the Department shall provide specific written notice in the inspection document, describing the observed condition of the Dam and informing the Dam owner of needed Maintenance Actions The notice in the inspection document shall inform the Dam owner of the opportunity to meet with the Department concerning the information provided in the inspection document.

(a) Upon request of the Dam owner, the Department may provide more specific information regarding the inspection and the maintenance needs of the Dam.

(b) The Department may evaluate whether needed Maintenance Actions were completed during the next scheduled inspection of the Dam or sooner, pursuant to OAR 690-020-0260(3).

(3) If, upon inspection of the Dam, the Department determines that the Dam owner has failed to take the necessary Maintenance Actions as identified in the notice of a prior inspection document, the Director may proceed to issue a proposed final order as provided in OAR 690-020-0460 or the Department and the Dam owner may enter into a stipulated corrective plan that provides dates certain by which necessary Maintenance Actions are performed.

(4) A proposed final order may include, but is not limited to, provisions:

(a) Requiring performance of the needed Maintenance Actions identified in the inspection document notice by a date certain as specified by the Department;

(b) An assessment of civil penalties consistent with OAR 690-020-0600.

(5) At any time subsequent to receipt of a proposed final order, the Dam owner may enter into a stipulated corrective plan to resolve the matters asserted in the proposed final order as provided in ORS 183.417.

(6) If the Dam owner performs needed Maintenance Actions to the satisfaction of the Department and consistent with the proposed final order or stipulated corrective plan, the Director may not assess or pursue civil penalties for the matters identified in the proposed final order or stipulated corrective plan.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.467, 540.455, 540.488

690-020-0340
Potentially Unsafe or Unsafe Conditions

(1) The following conditions may result in the Department concluding that a Dam is Potentially Unsafe:

(a) Embankment materials highly vulnerable to internal erosion;

(b) Highly variable and increasing rates of seepage that may lead to internal erosion;

(c) Seismic analysis determines significant Crest loss with little Freeboard remaining;

(d) For Dams in high seismic zones, a layer of liquefiable material in the Dam or its Foundation;

(e) Evidence of prior large rapidly moving landslides identified above the Dam, increasing the risk of Dam Failure from floods and earthquakes;

(f) Spillways are unable to pass the Inflow Design Flood as stated in OAR 690-020-0037 or Probable Maximum Flood;

(g) Issues on the Spillway invert that could lead to rapid loss of Spillway integrity during a flood; or

(h) Any other condition that meets the definition of Potentially Unsafe.

(2) The following conditions may result in the Department concluding that a Dam is Unsafe:

(a) A reduction in Spillway capacity;

(b) Movement of the Dam over a short period of time;

(c) Major loss of Freeboard;

(d) Wave erosion narrowing the Crest;

(e) Internal erosion with limited movement of Embankment material;

(f) Seepage level rising on the downstream face of the Dam;

(g) Landslide or other deformation on the Dam;

(h) Rapid erosion of the Spillway;

(i) Significant loss of mass of a concrete Dam;

(j) Concrete Spillway with large voids or openings through the slab;

(k) Conduit deteriorated to where Conduit collapse is reasonably possible;

(l) A Pressurized Conduit with holes in the pipe;

(m) Flashboards in place during high runoff season;

(n) Animal burrows penetrating deep into the Dam;

(o) Large trees growing near the Crest;

(p) Building a new Dam or increasing Dam Height without examination and written approval by the State Engineer of site plans, specification, and other supporting information for that Dam; or

(q) Any other condition that meets the definition of Unsafe.

(3) Notification of Potentially Unsafe or Unsafe Conditions. If, as a result of an inspection or analysis of a Dam that has a High or Significant Hazard Rating the Department concludes that corrective action is necessary to address a condition allegedly rendering the Dam Unsafe or Potentially Unsafe, the Department shall provide written notification to the Dam owner by registered or certified mail with return receipt requested, sent to the address of record on file with the Department, as per OAR 690-020-0180, for the Dam owner.

(a) The written notification shall include at least the following:

(A) An explanation of why the inspection or analysis of information and conditions causes the Department to conclude that the Dam is Unsafe or Potentially Unsafe;

(B) Any action the Department concludes is necessary to address the alleged Unsafe or Potentially Unsafe conditions;

(C) Notice to the Dam owner of the opportunity to meet with the Department to discuss the notification; and

(D) Notice to the Dam owner of the opportunity to provide information to explain why the Dam owner disagrees with the matters asserted in the notification alleging the Dam is Unsafe or Potentially Unsafe.

(b) Following issuance of a notification, the Department may attempt to resolve the Unsafe or Potentially Unsafe conditions in cooperation with the Dam owner. The Dam owner may endeavor to develop a plan and timeframe for corrective action that is agreeable to the Department. If the plan and timeframe are agreeable, the Department and owner may enter into a consent order to address the corrective action for timely resolution of the Unsafe or Potentially Unsafe conditions.

In determining whether a plan and timeframe is agreeable and developing a consent order, the Department may consider any relevant information, including, but not limited to:

(A) The design and construction of the specific Dam;

(B) The efforts and resources of the Dam owner; and

(C) The impacts associated with Dam failure.

(4) In addition to any other available remedies, the Director may issue a Proposed Final Order in the event the Department and the Dam owner do not agree to a plan and timeframe and enter into a consent order to address corrective actions, if the Dam owner fails to complete actions as provided in the consent order, in the event the Dam owner does not otherwise address the matters identified in the notification to the Department’s satisfaction, or if the Department concludes based on inspection or analysis that the Dam is Unsafe.

(a) The proposed final order shall include the specific information and conditions that have caused the Department to conclude that a Dam is Unsafe or Potentially Unsafe, shall be consistent with ORS 183.415, and shall provide notice of the opportunity for a contested case hearing pursuant to ORS 183. The proposed final order shall include the notification in subsection (3) of this section, if notification has not already been provided for an Unsafe Dam.

(b) The proposed final order may include, but need not be limited to, any or all of the following provisions:

(A) A requirement that the Dam owner consult with an Engineer to assess the nature and extent of the Unsafe or Potentially Unsafe conditions identified by the Department and, as necessary, to identify corrective actions to address the Unsafe or Potentially Unsafe conditions;

(B) Commencement and completion dates for any corrective action the Department determines is necessary to remedy the Unsafe or Potentially Unsafe conditions;

(C) Restrictions on the maximum Water level in the reservoir until corrective action has been completed to the satisfaction of the Department;

(D) Provisions directing that the Dam may not be used for the impoundment, restraint, or conveyance of Water until corrective actions have been completed to the satisfaction of the Department;

(E) A requirement to install and maintain monitoring equipment if the Department concludes that monitoring is necessary to protect life, property, or public infrastructure. The provisions requiring the installation and use of monitoring equipment at a Dam to monitor the Unsafe or Potentially Unsafe conditions shall include the ability to use the most economical monitoring equipment sufficient to protect life, property, and public infrastructure as determined by the Department.

(5) Upon issuance of a proposed final order, the Dam owner and Department may enter into a consent order to resolve the matters in the proposed final order as provided in ORS 183.417.
Any such document must include conditions to address the matters in the proposed final order as determined by the Department.

(6) If, following issuance of a proposed final order regarding a Dam that the Department has concluded is Unsafe, the Department receives a request for hearing from the Dam owner, the Director may request that the scheduling of any contested case hearing be expedited, and the Office of Administrative hearings shall expedite the contested case hearing to the extent that the office considers it practicable and will give the Dam owner reasonable time to prepare.

(a) In determining the expedited timeline practicable, the Office of Administrative Hearings shall consider, based on information provided by the Department, any conditions that may affect the urgency of the proceedings or the likelihood that Unsafe conditions may pose near-term threat to life, property, or public infrastructure.

(b) The reasonable time to prepare for a contested case hearing shall be based on the likelihood that Unsafe conditions may pose a near-term risk to life, property, or public infrastructure.

(7) Issuance of a proposed final order does not preclude the Department from pursuing any and all lawful remedies as the Department may determine are necessary to protect life, property, or public infrastructure including, but not limited to, seeking injunctive relief in the circuit court as provided in ORS 540.473.

(8) In addition to any other available lawful remedies, if a proposed final order issued under this section becomes final by operation of law or on appeal, and the Dam owner fails to comply with the order as specified in the order, the Director may request the Attorney General or the district attorney of

any county where all or part of the Dam is located to bring an action declaring the Dam a public nuisance and ordering its Removal at the owner's expense.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.458, 540.461, 540.470, 540.473, 540.476

690-020-0400
Emergency Action Plans (EAP)
(1) An owner of a High Hazard Dam shall develop an Emergency Action Plan (EAP) consistent with this section. The EAP is to assist the Dam owner and local emergency management personnel to ensure human safety in the event of a potential or actual Dam Failure..

(2) For new Dams or to increase the Dam Height of High Hazard Dams, the EAP is required to be submitted as part of the plans and specifications in OAR 690-020-0035 and OAR 690-020-0080(1), prior to commencing new Dam construction.

(3) Owners of Dams which have been reclassified to a High Hazard Rating will be required to develop and submit an EAP within one year of being notified of the reclassification by the Department.

(4) An EAP shall contain, at a minimum, the following key elements:

(a) Means for emergency condition detection;

(b) Means for emergency level determination;

(c) Identification of, and information necessary for, notification and communication to be made at each level of emergency condition, including, but not limited to, contact information required in OAR 690-020-0180(1);

(d) Description of actions to prevent a Dam Failure incident or to help reduce the effects of a Dam Failure to facilitate response to an emergency;

(e) A map of Dam Failure inundation zones developed using a Dam breach inundation analysis for varying conditions as specified by the Department, including, but not limited to, dry weather conditions and high flood conditions. The Department may require one inundation map if the dry weather and high flood flows are not substantially different.

The inundation mapping must include cross sections at locations of concern, and a description of expected depth and velocity of maximum breach flows at each cross section; and

(f) Procedures for termination of the emergency.

(5) The Dam owner shall file copies of the EAP with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located.

(6) The Department will, in consultation with the local Office of Emergency Management:

(a) Periodically review the EAP and may require updates to the plan that recognize the actual capabilities of the local emergency managers; and

(b) Determine the appropriate frequency for conducting emergency response exercises.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.479, 540.482, 540.485, 540.449, 540.488

690-020-0420
Immediate Action to Prevent Dam Failure
(1) If an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure and an Emergency Action Plan exists for that Dam, a Dam owner shall immediately implement the actions specified in the plan.

(2) If no EAP exists, and an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure, the Dam owner shall immediately notify by telephone or other method that ensures immediate notification:

(a) The local emergency services agency for the county where the Dam is located, via 9-1-1 call, if the dam has a Significant Hazard Rating;

(b) The Department; and

(c) To the extent practicable, Persons in areas where the potential for Dam Failure creates a risk to life, property, or public infrastructure.

(3) In addition, if an actual or potential Dam Failure creates an imminent risk to life, property, or public infrastructure, a Dam owner shall also take all practicable measures to prevent Dam Failure.

(4) If the Department is aware of conditions which indicate that immediate action is needed to prevent a Dam Failure, the Department may contact and advise the owner, operator, or individual in charge of the Dam regarding necessary actions to prevent the Dam Failure.

(5) If a Dam has a Significant or High Hazard Rating and presents an imminent risk of dam failure, the Department or its agents or representatives may enter the property without notice or permission of the pertinent landowner to access the Dam and evaluate the condition or risk or to undertake necessary actions described in subsections (6) and (7). The Department’s entry onto property pursuant to this subsection shall be to the extent entry is reasonable or necessary;

(6) The Department may communicate and coordinate actions necessary to reduce the risk of dam failure.

(7) If the Department observes that there is a rapidly increasing leakage risk of overtopping at a Dam that has a Significant or High Hazard Rating, the Department may open Gates or Valves and siphon or pump Water to reduce the Water levels in the reservoir.

(8) The Department may, as necessary to address an actual or potential Dam Failure that poses an imminent risk to life, property, or public infrastructure:

(a) Modify approval requirements for emergency construction work;

(b) Waive or modify the actions prescribed in an Emergency Action Plan; and

(d) Pursue any other lawful remedy.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.482, 540.485, ORS 540.488

690-020-0460
Proposed Final Order, Request for Hearing, Contested Case Process
(1) Proposed Final Order, Notice of Assessment of Civil Penalty.

A proposed final order or a notice of assessment of civil penalty must be consistent with the provisions of ORS 183.415, shall include notification of the right to a contested case hearing pursuant to ORS 183, and shall include any applicable or required element otherwise specified in Dam safety rules governing proposed final orders. A proposed final order or a notice of assessment of civil penalty must be served personally or by registered or certified mail.

(2) Request for Hearing. A Dam owner that receives a proposed final order or a notice of assessment of civil penalty has 30 calendar days from the date of service of the proposed final order in which to file a written request for hearing. The request for hearing must be filed either in person or by mail addressed to the Department's office in Salem, Oregon. The request for hearing may not be considered timely filed unless it is received in the Department consistent with this subsection.

The request for hearing must include a written response specifying the reasons for disagreement with the proposed final order.

(3) Contested Case Procedure. Contested case hearings resolving requests for hearing to proposed final orders issued by the Department under these rules shall be heard by administrative law judges from the Office of Administrative Hearings.
Hearings shall be conducted as provided in ORS 183 and the Attorney General's Uniform and Model Rules of Procedure under the Administrative Procedures Act in OAR 137-003-0501 to 0700 except:

(a) Only a Dam owner or the Dam owner's authorized representative may request a contested case hearing and be considered a party in any contested case;

(b) For expedited contested case hearings regarding proposed final orders addressing Unsafe conditions, discovery methods as provided in OAR 137-003-0566 shall not be allowed because the availability of other forms of discovery would unduly delay proceedings to address conditions that address a near-term risk of threat to life, property, or public infrastructure.

Notwithstanding, a party may request public documents pursuant to a request for public records made to the Department as described in OAR Chapter 690, Division 3; and

(c) Immediate review under OAR 137-003-0640 is to the Director only.

(4) Proposed Order in Contested Case. Following the close of the record for a contested case hearing, the administrative law judge will issue a proposed order and shall serve the proposed order on each participant to the contested case.

(5) Exception to Proposed Order. If the recommended action in the proposed order is adverse to any party, the party may file written exceptions to the Department within 15 calendar days after a proposed order is served.

(6) Final Order. The Director may consider any exceptions received and shall issue a final order as provided in OAR 137-003-0665. An order adverse to a party may be issued upon default as provided in OAR 137-003-0672.

(7) The Department and a Dam owner may at any time use informal or alternative means to resolve a contested case hearing. When informal disposition of a contested case is made by stipulation, agreed settlement or consent order, the final order that incorporates the informal disposition is not subject to judicial review.

STATUTORY/OTHER AUTHORITY: ORS 183, 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 183, 540.458, 540.461, 540.467, 540.470, 540.488, 540.995

690-020-0600
Civil Penalty Assessment for Dam Safety
(1) The Department may assess civil penalties for the following violations:

(a) Constructing a Dam without prior written approval from the Department of the final Dam design, construction documents, and operation documents as described in OAR 690-020-0080(1) and 0140(1);

(b) Impoundment of Water behind a Dam before final documentation has been submitted and accepted by the Department as provided in OAR 690-020-0080(4) and 0150(6);

(c) Removal of a High or Significant Hazard Dam prior to providing a Removal plan, as required in OAR 690-020-0160;

(d) Failure to file an Emergency Action Plan with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located, as provided in OAR 690-020-0400; and

(e) Failure to complete needed Maintenance Actions on a High or Significant Hazard Dam, as identified in a prior inspection document sent from the Department to the Dam owner, as described in OAR 690-020-0310.

(2) The civil penalty for Constructing a Dam prior to obtaining written approval from the Department of final Dam design, construction, and operation documents prior to Dam construction activity shall be $2,000 for a High Hazard Dam, $1,000 for a Significant Hazard Dam, and $500 for a Low Hazard Dam.

(3) The civil penalty for impounding Water prior to submission and acceptance by the Department of the final plans and specifications shall be $1,000 per occurrence for a High Hazard Dam, $500 per occurrence for a Significant Hazard Dam, and $250 per occurrence for a Low Hazard Dam.

(a) Each day the Dam impounds Water is considered a new occurrence and violation. A civil penalty may be assessed for each day of violation for the period the reservoir is impounding Water until satisfactory completion documents are submitted to and accepted by the Department, until the reservoir is emptied, whichever is sooner.

(b) The Department may remit all or a portion of a civil penalty if completion documents existed but were not submitted, and those documents meet the criteria, or for Dams which are modified to be exempt from Dam safety requirements as per ORS 540.446(1).

(4) The civil penalty for beginning construction work to remove a Dam rated as High or Significant Hazard prior to submission and acceptance of a Dam Removal plan, failure to modify the plan if required, or failure to follow the modified plan shall be $2,000 for a High Hazard Dam and $1,000 for a Significant Hazard Dam.

(a) Each day construction work is performed to remove the Dam is considered a new occurrence and violation. A civil penalty may be imposed for each day of violation beginning on the day Removal activities began until the Dam is no longer storing Water and construction work to remove the Dam has ceased.

(b) The Department may remit all or a portion of this civil penalty if the Department receives and accepts a Dam Removal plan and determines that Dam Removal was consistent with the plan and completed safely with no downstream damage.

(5) The civil penalty for failure to file an Emergency Action Plan for a High Hazard Dam with the Department, the Office of Emergency Management, and the local emergency services agency for the county where the Dam is located shall be $2,000.

(a) Each month the Emergency Action Plan is not filed is a new occurrence and violation. A civil penalty may be imposed for each month of violation beginning on the date the notice of violation was first provided to the responsible party.

(b) The Department may remit all or a portion of the civil penalty if development of the plan is underway and the plan is submitted within 60 days of the due date.

(6) The civil penalty for failure to complete needed Maintenance Actions identified in a prior inspection document for Dams rated as High or Significant Hazard shall be:

(a) A civil penalty of $500 may be assessed for failure to perform required Maintenance Action(s) on a High Hazard Dam which could result in the Dam becoming Unsafe. Each month will be considered a new violation until the required Maintenance Action(s) is completed;

(b) A civil penalty of $250 may be assessed for all other required Maintenance Action(s) for a High Hazard Dam. Each month will be considered a new violation until the required Maintenance Action(s) is completed;

(c) A civil penalty of $250 may be assessed for failure to perform required Maintenance Action(s) on a Significant Hazard Dam which could result in the Dam becoming Unsafe. Each month will be considered a new violation until the required Maintenance Action(s) is completed;

(d) A civil penalty of $150 may be assessed for failure to complete all other required Maintenance Action(s) for a Significant Hazard Dam. Each month will be considered a new violation until the required Maintenance Action(s) is completed; and

(7) The Department may remit all or a portion of a civil penalty, considering the Dam owner’s efforts to comply.

STATUTORY/OTHER AUTHORITY: ORS 536.027, 540.488
STATUTES/OTHER IMPLEMENTED: ORS 540.449, 540.452, 540.467, 540.482, 540.488, 540.995